Growth Opportunities and Debt Covenants: Evidence from a Natural Experiment*

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Abstract

Debt covenants reduce agency cost of debt while bringing into contracting cost which increases with firms' growth opportunities. In this paper, we exploit an unexpected increase in military spending after the War of Afghanistan to establish a causal relationship from growth opportunities to firms' bank loan covenants. Using a difference-in-difference strategy, we find that defense contractors borrow with much less covenants, especially with less restrictions in investment spending and looser financial covenants. Consistent with firms' borrowing responding to a shock to growth opportunities rather than to increased current revenues, we find that the effect concentrates around the outbreak of the war and no effect is observed in years either before or after 2001. Further analysis shows the effect mainly comes from firms for which covenants are more costly, i.e. more diversified firms, firms that are more opaque and firms in need of more financial flexibility. Our findings are consistent with firms relieving debt covenants to minimize contracting cost as a response to increased growth opportunities and thus support the costly contracting hypothesis by Smith and Warner (1979).

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1 Introduction

Firms trade off the reduced agency cost from writing tighter covenants in debt contracts and the loss of flexibility in firms' financing and investment behavior. Debt covenants help reduce agency cost and increase firm value through monitoring and creditor control (Smith and Warner 1979; Aghion and Bolton 1992; Rajan and Winton 1995). However, debt covenants can be inefficient due to various contracting costs. Specifically, Smith and Warner (1979) portray several tradeoffs when various types of covenants are introduced into debt contracts. The idea is that the potential loss in firm value when a certain type of covenant is imposed on the firm constitutes the opportunity cost[1]. Another source of inefficiency is the technical default trigger specified in covenants which are tied to imperfectly measured financial ratios (Berlin and Loeys, 1988). These inefficiencies become especially prominent when firms have higher growth opportunities. As highlighted by Berlin and Loeys (1988), covenants become more costly as the lost value from premature liquidation of projects increases.

Despite extensive theoretical explanations about how optimal debt covenant restrictions are determined by firms' growth opportunities, empirical studies have not reached a conclusive understanding about the relation between the two. A recent paper by Billett and Mauer (2007) models the joint determination of leverage, debt maturity and covenants. They find a robust positive relationship between growth opportunities and covenant protection on bond-holders. However, beginning with Kahan and Yermack (1998), several recent studies generate opposite results[2]. One reason could be the potential endogeneity problem in estimating the effect of growth opportunities on debt covenants. This calls for an empirical setting where covenant changes that merely come from varying growth opportunities can be

[1]For instance, restrictions on new debt issues protect the creditors from being diluted and the firms from suffering from debt overhang. However, they could aggravate the under-investment problem and the firm value that is foregone constitutes one part of the contracting cost. Similarly, merger restrictions make the borrower firm suffer from an opportunity loss once synergistic mergers are prohibited by the covenant.

[2]See Nash, Netter, and Poulsen (2003), Chava, Kumar, and Warga (2010) and Bienz, Faure-Grimaud, and Fluck (2011) for how growth opportunities negatively affect the intensity of bond covenants. Specifically, Bienz, Faure-Grimaud, and Fluck (2011) shows that firms with high growth options are more likely to issue defeasible bonds which make it possible for borrowers to remove bond covenants ex post. Achleitner, Braun, Hinterramskogler, and Tappeiner (2012) find that high-growth firms negotiate greater flexibility by setting looser financial covenants with lenders. Goyal (2005) also finds that bank charter values, measured by the market-to-book ratio, determines the writing of restrictive covenants in bank debt.

successfully isolated.

In this paper, we use the War of Afghanistan as an exogenous shock to the growth opportunities of defense contractors to examine the change in the use of covenants. This war which broke out in late 2001 after the September-11 terrorist attack leads to an abrupt defense spending increase in the US. On the one hand, the escalating amount of defense contracts awarded to defense contractors greatly boosted the capability of these firms in generating future cash flow in an unexpected fashion. On the other hand, the shock to other firms is minimal[3]. Also what makes this war a good setting in testing the effect of growth opportunities on debt covenants as well as other financial policies is that it is public information. Therefore, many of the issues arising from information asymmetry which generally increases with growth opportunities are ameliorated here[4]. We evaluate our experiment by showing that compared to firms which receive government contracts unrelated to defense products or services, defense contractors do enjoy higher growth opportunities after the war broke out. Specifically, the increase of the market-to-book ratio from the pre-war (1996-2001) to the post-war period (2002-2012) is about 6% larger for defense contractors relative to the control firms. The differential intensity and choice of covenants for these two groups of firms allows us to identify a clean effect of growth opportunities on debt covenants. We identify 273 firms that receive defense contractors after the war which form our *treated* group.

Then, we look at how the unexpected increase in growth opportunities could alter the number of covenants in bank loans. We measure the change of the number of covenants in loans borrowed by defense contractors before and after the war relative to a control group of firms. We find that on average defense contractors borrow with 0.5 fewer covenants. Weaker evidence can be found if we compare defense contractors with firms which are in the same SIC3 industries. To further validate the causal relationship and also to gauge the evolution of this effect, we use a placebo test to determine whether the same effect can be found using artificial treatment years. Interestingly, the decline in covenant intensity is significant only at the real treatment year, i.e. year 2001. This finding indicates that firms react right after

[3]There are numerous papers illustrating the growth (and employment) effect of military spending on the general economy, such as Barro and Redlick (2011), Nekarda and Ramey (2011) and Ramey (2011).

[4]Lower information asymmetry in firms' investment opportunities could mitigate the incentive conflicts. However, whether low information asymmetry leads to lower covenant intensity is an empirical question.

the war by loosening the loan contracts and increased growth opportunities are the driving force behind this decline[5].

Debt covenants differ in their restrictiveness on firm's flexibility to realize growth opportunities. For instance, cash flow covenants might not be as prohibitive as investment restrictions in restricting firms' investment behavior. Therefore, the decline of restrictiveness after the war might differ across different types of covenants. First, we find evidence that the total number of negative covenants declines by 0.3. Further analysis shows that firms reduce the use of almost every type of negative covenants as a response to higher growth opportunities. Specifically, the likelihood of being restricted by asset sale covenant declines by 11%. The likelihood of having debt issuance covenant and equity issuance covenant declines by 10% and 9%, respectively. Second, neither the total number nor the tightness of financial covenants of the defense contractors has significantly different changes after the war. However, we do find the likelihood of having investment spending restrictions (e.g. capital expenditure covenant) declines by 6%, illustrating the importance of relieving investment restrictions. We also look at a new feature of financial covenant design which specifies different covenant thresholds in the course of loans, i.e. covenant build-ups. Consistent with defense contractors having less tight covenants, the probability of banks including build-ups that tighten covenants after the loan initiation is significantly lower. For instance, the probability that a defense contractor having an increasing trend in its *total debt to EBITDA* and *interest coverage* covenant is lower by 15.6% and 11.4%, respectively. This implies that managers are given more room to seize new debt financing and to invest after they seize new debt financing.

Next we explore several channels through which increased growth opportunities could lead to fewer debt covenants. Firms for which being flexible - both on the financing side and the investment side - is more valuable tend to negotiate away covenants when growth opportunities increase. Using three measures that characterize how valuable operational flexibility is for firms, we find that this is indeed the case. In times of high growth opportunities,

[5]Note that we can partially rule out several concerns here by observing that the decline is insignificant before the war and no longer significant even one year after the war. For instance, it is possible that lobbying by the defense industry is the omitted variable which is correlated with both growth opportunities and firms' debt policies. However, this cannot be reconciled with the insignificant result before the war.

these firms retain enough operational flexibility to maximize firm value. Another possible channel is the information asymmetry. The contracting cost of covenants which are hinged upon imperfect information increase with firms' growth opportunities. And this cost from inefficient control is especially large when the firm is more opaque. Our empirical results also support this conjecture. Financial flexibility adds value to the firm when there is significant opportunities of upside growth (Gamba and Triantis, 2008). Using several firm-level proxies for financial flexibility, we find a significantly larger decline of covenant use for firms that are lack of financial flexibility. Our paper thus lends additional support to the "costly contracting hypothesis" by showing that covenants hurt firms that will lose most from inefficient restrictions. In the context of our paper, these firms tend to lack of financial flexibility, have more information asymmetry and require more operational flexibility, which makes them less capable of capturing valuable growth opportunities.

Although defense and non-defense contractors have a similar trend of the number of covenants and growth opportunities before the war broke out, the two groups of firms might not be comparable to each other. To take this concern into consideration, we employ a matching DID estimator to form an alternative control group. For each loan borrowed by defense contractors, we pick out 2 loans from the universe of loans borrowed by other U.S. public firms. A simple DID analysis reveals that defense contractors have a decline of covenant intensity that is 0.4 larger than that of the matched non-defense contractors, an effect that is very close to our baseline results. As before, loans by defense firms contains significantly less restrictions on equity issuance on the general covenant side. Besides, defense firms become 7% and 4% less likely to have financial covenants on investment and liquidity, respectively. Finally, defense contractors do not have to build up interest coverage to maintain solvency after the borrowing and this decline is as large as 13%.

We conduct several other robustness tests to ensure the validity of our results. First, we show that our results are robust to including the credit rating of firms and different time trend between defense and non-defense firms. Also, we show that our results are not driven by the lobbying activities by the defense industry to protect jobs. The major effect comes from non-manufacturing defense firms and firms that are more dependent on contracts from the Department of Defense. Third, the observed decline is not a result

of firms with certain characteristics receiving more generous terms in the syndicated loan market after the war. For instance, larger and more profitable firms do receive less covenants after the war. However, our results are robust to taking this into account. Fourth, we use an alternative sampling method to define a "potential" set of defense contractors. These firms report a business segment that provides defense products or services but not necessarily receive procurement contracts. We find even stronger results and thus confirm our main findings.

As complementary evidence on changed creditor control following a shock to firms' growth opportunities, violation-induced firm policy changes are also examined. We find that new debt issuing activities of defense contractors decline by 2.7% less two quarters after violations, compared with non-defense contractors. Other firm policy changes, such as investment, new equity issues and sales of assets, do not differ between these two groups. However, this is not surprising considering that restrictions are already loosened in original loan agreements. Moreover, we show that defense contractors change their borrowing behavior on other aspects, such as the amount and maturity of debt. They tend to borrow significantly smaller loans and loans with shorter maturity after the war. This finding also lends support to the notion that firms tend to retain more flexibility to pursue increased investment opportunities.

Our paper contributes to the empirical literature on the identification in the context of financial contracting. In the context of this paper, the relationship could well come in both ways. One the one hand, high growth opportunities imply a less intensive use of covenants, as shown in both this paper and Smith and Warner (1979). On the other hand, covenants might have value implications and thus increase firms' growth opportunities. For instance, Nini, Smith, and Sufi (2009) show that firms who obtain a bank loan with restrictions on capital expenditures experience a subsequent market value increase. Very few papers take into account the joint determination of covenants and other firm financial policies. One of the exceptions Billett and Mauer (2007) who employ a simultaneous equation system to study how growth opportunities determine firm leverage, debt maturity and bond covenant intensity. To isolate the effect of interest cost on covenants, Bradley and Roberts (2004) use a two-step approach which is based upon the trade-off between interest rate and covenants. However, their procedure cannot be applied to the analysis on how changing firm funda-

mentals affect the use of covenants. A more recent paper by Hollander and Verriest (2013) use borrower-lender distance as a proxy for information asymmetry and find that relatively uninformed (remote) lenders write more restrictive covenants[6]. Another paper by Giambona and Golec (2012) employs the passage of an Act in 2010 which changed pharmaceutical firms' growth opportunities and find that pharmaceutical firms use more unsecured debt following the act. Our results complement the findings in their paper by showing that apart from the debt structure, the contractual terms also change as a response to growth opportunity shocks[7].

Our paper is also related to the research on costly financial contracting. Debt covenants and the associated creditor control can be a costly means to mitigate agency problems of debt, especially when firms' growth opportunities are large. First, routine restrictions aggravate the potential underinvestment problem arising from risky debt financing. Particular covenants such as those which restrict investment limit firms' investment activities. For instance, Nini, Smith, and Sufi (2009) find that the existence of capital expenditure restrictions significantly reduces firms' investment. Our evidence suggests that firms do relieve covenants that would lead to underinvestment, such as capital expenditure, debt issue and equity issue restrictions. Second, covenant violations and renegotiations are more costly for growth firms. It has been documented that loans with covenant protection are renegotiated more frequently *ex post* (Roberts 2012; Nikolaev 2013). Anecdotal evidence reveals that renegotiations on loan agreements require a substantial amount of time and resources. Also violations to debt covenants (technical default) lead to material changes of both financial and operational activities of a firm[8]. Although our results show that the total number of financial covenants does not decline significantly, we do find less build-ups embedded in fi-

[6]One concern about using locations as an instrument arise from the endogenous borrower-lending matching. Firms who borrow from remote banks might be fundamentally different from firms who obtain loan financing nearby. Therefore it is not clear whether the estimated effect of distance on covenants reflects how information asymmetry determines debt contractual restrictions.

[7]Our empirical setting also enjoys several advantages. First, different from their focusing on the pharmaceutical industry, our treated group consists of firms from more than one industry. Besides, we have a comparable length of pre- and post-treatment period, making our sample more balanced and results more robust to timing. Perhaps most importantly, our experiment is more of an unexpected event while the passage of a new act is very likely to be expected.

[8]Post violation, we see a cut in the availability of credit lines (Sufi, 2009), fewer innovative outputs (Gu, Mao, and Tian, 2013), a decrease in capital expenditure, a drop in acquisition expenses, a decrease in net debt issuance and a reduction of payout to shareholders (Nini, Smith, and Sufi, 2012).

nancial covenants which give managers more room after the loan initiation. Third, growth firms tend to be more informational asymmetric. Perhaps one of the most important sources of inefficiencies of covenants come from the fact that technical default and creditor interventions are hinged on imperfect accounting information (Berlin and Loeys). According to Jr. and Watts (1992) and Gaver and Gaver (1993), growth firms tend to be more difficult to observe and monitor. Managerial misconduct as such earnings management would make covenants an ineffective measure of firm performance[9]. Berlin and Loeys (1988). We find that the decline in covenants is especially large for firms with higher information asymmetry.

The paper is organized as follows. In Section 2, we introduce the exogenous event used in this paper and describes the sample used for empirical analysis. In Section 3, we illustrate the sources of bias from simple cross-sectional regressions and introduce our difference-in-difference strategy to identify the causal relationship from growth opportunities to the tightness of debt covenants. Section 4 presents the main empirical results. Finally, Section 5 provides some robustness tests and Section 6 concludes the whole paper.

2 Data, Sample and Statistics

2.1 The Afghanistan War

We use a similar identification strategy as in Goyal, Lehn, and Racic (2002) who exploit the dramatic changes of U.S. defense spending during the period of 1980-1995. During this period, the defense spending increased substantially after Ronald Reagan was elected president and later dropped after the Vietnam War. We exploit a more recent and also unexpected increase in U.S. defense spending, the increase in defense expenses after the September 11 terrorist attack. In an effort to dismantle al-Qaeda and eliminate its safe haven by removing the Taliban from power, NATO and its allied forces launched the War in Afghanistan which has not yet ceased completely. This military expense increase and the associated increase in government purchase from defense contractors was not expected[10]. In

[9]See Beatty, Weber, and Yu, Costello and Wittenberg-Moerman (2011) and Li (2012), among others for the effect of accounting information quality on the design of debt covenants.

[10]War remained undetermined even when the Congress passed legislation titled Authorization for Use of Military Forces against Terrorists on September 14, 2001. Even if this legislation was later signed by

figure 1, the war period is marked with shadow in the figure. Before 2001, there used to be a decreasing trend after the fall of Berlin War in 1989. Defense spending increased from 400 billion in 2002 to as high as 650 billion in 2009, with DoD contract award amount following the same trend.

Not only do the DoD contract volume increase after the war, the type goods and services outsourced also changes dramatically. For instance, DoD increasingly outsourced the battle field services, such as IT and logistics to contractors. The volume of contracts from department in charge of transportation (USTRANSCOM), information systems (DISA) and military health care (TMA) increases from 27 billion in 2001 to 79 billion in 2009. Also since the terrane of both Afghanistan and Iraq is mainly inland, military devices used by the Army increases disproportionately, compared with the Navy and the Air Force, according to a report by Center of Strategic and International Studies (Ellman, Morrow, and Sanders).

We collect data on realized awards to U.S. domestic firms from Eagle Eye Publishers, inc. which compiles procurement contract data provided by Federal Procurement Data System-Next Generation (FPDS-NG). FPDS-NG provides detailed information on procurement contracts by all US government agencies, including the dollar amount, the name of the recipients and the contracting agencies. Recent research relying on this data set includes Draca (2012), Goldman, Rocholl, and So (2013) and Tahoun (2014). Since the FPDS-NG only show recipients on the subsidiary level, Eagle Eye traces every subsidiary back to its parent firm. We first pick out all contracts awarded by the Department of Defense. Then based up the total dollar value of DoD contracts received, we rank defense contracts each year and pick out the top 1000 contractors. Out of the top 1000, we select those firms that could be linked to both Compustat and DealScan from which we have to retrieve firm accounting and bank loan information[11]. This set of firms are defined as our treated sample, with the underlying assumption that the growth opportunities for those firms increased permanently once it received an award from the Department of Defense at some point of time.

President Bush, there was still uncertainties centering on the possibility of war. US and NATO also began to withdraw troops from Afghanistan in 2011.

[11]The ideal treated sample in this setting includes all *potential* firms that benefit from this sudden increase in military spending. However, it is non-trivial to define a set of candidate firms for contract award from the DoD. Also it is impossible to evaluate how the sudden increase in military expenditures affected the *future* revenue of ideally potential defense contractors.

The control group is defined in several ways. In the main analysis, we rely on a control group which contains other government contractors. Following the same sample selection process as the treated, we collect information of the top 2000 non-defense contractors each year from 2001 to 2012. Since some firms (such as Boeing Co.) receive contracts from both the DoD and other non-defense departments, we exclude those firms from the control sample. We also consider a control group which consists of all borrowers from the same three-digit SIC industry as defense contractors. For robustness, we employ propensity score matching to select a control group from the corporate universe based upon carefully defined firm and loan characteristics.

2.2 Bank loan sample

We collect bank loan covenant information from LPC DealScan which collects information of mainly syndicated bank loans with a focus on U.S. firms. Loan covenants are written on the level of packages which often contain several tranches or facilities. DealScan collects general covenants, net worth covenants and financial covenants. For financial covenants, it codes the name of covenants and the associated restrictions on each ratio[12]. In total there are 26,801 loans with feasible information of financial covenants. Loans that are closed before 1996 are deleted since covenants back to that period are very rarely observed according to Nini, Smith, and Sufi (2009). The loan amount and number of lenders can directly be observed on the package level. For other loan characteristics, we aggregate information provided in loan facilities. The longest maturity among all facilities are used as the maturity of the loan. Each facility has its own interest rate. We weight the interest rate by the corresponding facility amount and generate an amount-weighted average of interest rate of the loan. Some facilities' interest rate varies with pre-specified performance measures, such as credit ratings. Whenever there is at least one facility inside a loan deal has performance pricing grid, that loan is considered to be performance sensitive debt. The same method applies to loan security.

[12]Nini, Smith, and Sufi (2009) have pointed out that DealScan becomes somewhat unreliable in coding financial covenants, especially capital expenditure restrictions. Instead, they construct a new data set for a small sample of firms for which they download the original loan agreements. However, due to the sample size concern, we use DealScan as the primary data source.

We then match government contractors to DealScan using the name of the parent firm. The bank loans are then matched to the borrower firms in Compustat and relevant firm characteristics are extracted[13]. We use firm characteristics the same quarter with the loan closing date. To mitigate the impact from outliers, we winsorize all variables at the 1st and 99th percentiles. Excluding loans by financial (SIC 6000-6799) and utility firms (SIC 4909-4943) results to 14,221 loans with valid information on both covenants and key firm characteristics. We end up with 8,671 loan deals with complete information on key variables. In total there are 908 loans borrowed by 273 defense contractors and 1304 loans by 430 non-defense contractors. As the second control group, 2,692 firms in the same SIC-3 industries as the defense contractor borrow 6,459 loans during our sample period. As is shown in figure 2, the borrowing by both the treated and control group is quite pro-cyclical. However, there is a sharp difference around 2001, with non-defense contractors maintaining their historical level of borrowing while defense contractors starting to borrow more.

2.3 Summary statistics

In our main analysis, we use the a set of financial ratios that have been documented to determine covenant intensity. These are the natural logarithm of the book value of assets, the market-to-book ratio, book leverage, profitability and tangibility, similar to Bradley and Roberts (2004). The fraction of loan officers reporting a tightening lending standard is retrieved from Federal Reserve Bank in St. Louis with quarterly frequency and is used as a credit market measure for the ease of obtaining a loan. The variables are defined in Appendix I and will be discussed in the later section.

Summary statistics for defense contractors, non-defense contractors and industry peer firms before the war are presented in panel A of table 1. There are 295 loans by defense contractors with complete information on all of the variables listed in the table. The number of loans by non-defense contractors and industry peers are 485 and 3016, respectively. Defense contractors are the largest in firm size, have the lowest market-to-book ratio, the least amount of cash on hand and the least volatile cash flow. When they borrow from

[13]We thank Michael Roberts making available the table linking DealScan to Compustat, as used in Roberts and Chava (2008)

banks, the average loan size is 33% of the book value of assets. The maturity is as long as 53 months, the longest among the three groups of firms. Their loans also contain more covenants, both financial covenants and negative covenants (sweeps). On average, loans by defense contractors contain 5 covenants, including 3 financial and 2 negative covenants. The spread is however the lowest, with a substantial difference between defense contractors and the other two groups of firms. It is possible that defense contractors before the war choose a low interest rate at the expense of high covenant restrictions. The loan packages for defense contractors are also funded by a larger syndicate of lenders. On average, there are 12 lenders providing funding, compared with 9 and 5 lenders for non-defense contractors and industry peer firms. About half of the loans borrowed by defense contractors are unsecured. Loans also have interest spread hinged on firm performance measures in 84% of the cases.

Panel B describes the loan sample after the war. The sample size is twice as large as before the war. The market-to-book ratio of defense contractors is till the lowest. However, a notable change is that the difference is much smaller. Before the war, the market-to-book ratio of defense contractors is 0.35 lower than that of non-defense contractors and 0.87 lower than industry peers. However, it is about the same level as non-defense contractors and only 0.26 lower than industry peers. Observing that the gap of market-to-book is becoming smaller after the war is critical to our empirical strategy. Our regression analysis also shows the same results. Compared with the time before the war, defense contractor borrowers are even larger in firm size. There is a de-leveraging around 4%. Note that defense contractors are just as profitable as the other two groups of firms.

3 Identification

We first illustrate how growth opportunities have increased with the inception of the war and then introduce a DID approach to identify the effect on bank loan covenants.

3.1 Growth opportunities pre- and post-war

How defense contractors benefit from the war is difficult to define both qualitatively and quantitatively. To gain an understanding of the possible impact, we first provide some

anecdotal evidence on how the War has given defense contractors more growth opportunities and then quantify this effect.

3.1.1 Anecdotal evidence

We employ a SEC filing parser and search three key words ("Afghanistan", "Operation Enduring Freedom" and "Iraq") from 10K's and 10Q's by government contractors from year 1999 to 2004 and extract both 5 lines before and after each hit. What is common between defense and non-defense contractors is the fact that the war has severely impaired the business environment in many aspects, such as customer orders and oil prices. However, only in defense contractors can we find evidence that the war has increased the investment opportunities in various ways. Unsurprisingly, defense contractors tend to down play how they directly benefit from the military operations in the Middle East in their filings. However, we still locate 36 filings by 11 defense contractors in total. There are 9 filings in year 2002, 23 in year 2003 and 4 in year 2004. In its 2002 fiscal year annual report, as the second largest defense contractor in the world, Boeing Co. made the following comments.

> Near-term DoD budgets have increased, and longer-range forecasts expect DoD budgets to grow faster than anticipated prior to September 11, 2001. Events like Operation Enduring Freedom and the continuing war on global terrorism reaffirms the need for...transformation that will achieve and maintain advantage.

Similar words can be found in 10-K's and 10-Q's by firms such as Lockheed Martin, Titan Corp, Halliburton Co, Harris Corp, etc. All these statements indicate that defense contractors gain more growth opportunities right after the war. The effect of the Afghanistan War continued and later was propagated by the US decision to invade Iraq which further opened up new growth opportunities for defense contractors[14]. For instance, in its 10-Q for the first fiscal quarter of 2003, Halliburton Co made the following statement.

[14]One trend that is not mutually exclusive to the military activities in the Middle East is the investment in homeland security. The increasing demand for facilities used in homeland security is also mentioned in many firms' reports.

> We expect growth opportunities to exist for additional security and defense support...Demand for these services is expected to grow as a result of the armed conflict in Iraq and subsequent reconstruction period...

In the same year, Boeing continued to see growth in the DoD budget and at the same time aligned its product development as well as production with the transformation of US defense policies. Also we find products that are successfully deployed in the Afghanistan battlefield are expecting future funding and development. This highlights another channel through which the war impacts firms' investment, i.e. the internal allocation of funds[15].

Anecdotal evidence also supports that firms do respond to these changes on the policy of DoD. In 2003, Lockheed Martin acquired the majority of the federal government information technology (IT) business of Affiliated Computer Services, Inc. (ACS). Concurrently, it divested its commercial IT business which is acquired by ACS. As a consequence, the contribution of commercial sales to total sales declines from 9% in 2000 to 3% in 2008. At the same time, the contribution of revenues from the US government increases from 70% in 2001 to 85% in 2008. Taken together, these evidences suggest that firms re-define their investment set to cater for the changing policies of DoD after the war, aside from benefiting from higher growth opportunities.

3.1.2 Quantitative evidence

We then use a set of regressions to test if there is indeed an increase in growth opportunities for defense contractors, as well as to gauge quantitatively the magnitude of increase. This exercise also helps to overcome the concern over the "growth effect" of government spending which is documented recently in Barro and Redlick (2011), Nekarda and Ramey (2011) and Ramey (2011). In other words, the entire corporate sector might also be affected by increased military spending post September-11, which invalidate our experiment. We follow Goyal, Lehn, and Racic (2002) and estimate a panel regression of growth opportuni-

[15]Multi-segment firms' investment may not respond efficiently to the changes of growth opportunities of their business segments. Due to frictions such as agency problems and divisional manager rent seeking, internal capital markets are not efficient. See studies such as Shin and Stulz (1998), Scharfstein and Stein (2000), Ozbas and Scharfstein (2010) and Duchin and Sosyura (2013) for details.

ties from 1988 to 2012 with firm fixed effect. The sample period is expanded into 1989 in order to have a longer panel and also to exploit the decline of defense after the fall of Berlin Wall in 1989. Compared with the period from 1996 to 2001 in which defense spending is in the trough, defense contractors should enjoy lower growth opportunities before 1996 and then higher growth opportunities after 2001 as a result of the war. Therefore, we set up two interaction terms between the defense contractor dummy and dummies for (1) period 1989-1995 and (2) period 2002-2012. According to our hypothesis, the first interaction term should be negative and the second positive.

Following Goyal, Lehn, and Racic (2002), we use five measures as proxies for growth opportunities. The results presented in table 2 demonstrate that defense contractors in general do enjoy higher growth opportunities after 2001. For instance, the market-to-book ratio of defense contractors increases by 6% after the war, compared with non-defense contractors. The other measures generally support our expectation, except relative capital expenditure in column (4) in panel A.

As complementary evidence, we also look at the change of other firm financial policies around the war. As shown in table A2, defense contractors reduce their leverage during the post-war period and this de-levering is mainly through an increase in new equity issuance. However, neither new debt issuance nor debt retirement show any significant changes around 2001. Consistent with what Goyal, Lehn, and Racic (2002) have found, firms tend to use more short-term debt once faced up with higher growth opportunities. All these evidence collected, the changes of other firm characteristics post-war have mixed implications on covenant intensity[16]. In the main analysis, we control for these factors in our covenant prediction model to further validate our argument.

3.2 Empirical Methodology

A simple OLS regression of the use or the restrictiveness of debt covenants on measures of growth opportunities (e.g. Tobin's Q) is almost always biased. The fact that some of these

[16]Untabulated results using the similar method indicate that defense contractors hold more cash, pay less dividends, have higher operating cost (cost of goods sold/sales), have higher current ratio, etc. However, they do not differ with respect to interest coverage, acquisition volume, or asset growth.

possible sources of biases lead to an overestimated effect and others lead to an underestimated effect further complicates the analysis. Assuming for simplicity that covenant restrictiveness is predicted via a simple linear model, the coefficient of interest is therefore

$$\gamma = \frac{Cov\left[C_i, G_i\right]}{Var\left[G_i\right]} = \gamma_2 + \frac{Cov\left[\epsilon_i, G_i\right]}{Var\left[G_i\right]}$$

where γ is the coefficient estimate, γ_2 is the coefficient itself and ϵ_i is the residual term in the linear model predicting the restrictiveness of covenants C_i using growth opportunity measure G_i. In the absence of endogeneity, $Cov\left[\epsilon_i, G_i\right] = 0$ and $\gamma = \gamma_2$. However, prior theoretical work and empirical evidence suggests that several imperfections exist such that simple OLS regressions produce biased estimates.

- Simultaneity bias: For instance, insofar as debt covenants are affected by managerial agency problem, shown by Chava, Kumar, and Warga (2010), and growth opportunities are defined partly by individual managers, failing to account for agency issues biases the estimate. If managers with mis-aligned interest have adverse effect on growth opportunities and debt holders include covenants as a protection against managerial agency issues, it is very likely that the OLS underestimates the true effect as $Cov\left[\epsilon_i, G_i\right] < 0$.

- Reverse causality: Restrictions included in debt covenants, such as the capital expenditure restriction as discussed in Nini, Smith, and Sufi (2009), are able to affect firms' investment and therefore growth opportunities significantly. Combined with the fact that debt covenants are quite "sticky", it implies that the estimated effect may suffer from reverse causality. In other words, it is difficult to isolate the effect from previous debt covenants' effect on current growth opportunities. In this case, $Cov\left[\epsilon_i, G_i\right] < 0$ and the observed effect is again downward biased.

- Measurement error: Indicators usually adopted in previous works as measures for growth opportunities, such as Tobin's Q, are very likely to be mis-measured (Erickson and M. Whited, 2000). Depending on the true effect, OLS estimates tend to over- or under-estimate the coefficient as measurement errors induce a bias toward zero, i.e. the attenuation bias due to measurement error means that both $\gamma > \gamma_2$ and $\gamma < \gamma_2$ are possible.

To establish a causal relationship between the growth opportunities and the use of loan covenants, we employ a difference-in-difference poisson regression which is specified as follows.

$$E\left[C_{it}|X\right] = \exp\left\{\alpha + \gamma_1 Post_t + \gamma_2 Post_t * Contractor_i + \gamma_3 Contractor_i + \sum_{j=1}^{p} \beta_j x_{ijt} + \epsilon_{it}\right\}$$

The dependent variable is the total number of loan covenants, denoted by C_{it}. The variable $Post_t$ takes the value of one if the loan is closed in years after 2001, and $Contractor_i$ indicates if the firm is a defense contractor. The independent variable of interest is the interaction term between a dummy indicating the post-2001 period and the dummy for a firm being a defense contractor. If the sudden increase in growth opportunities after the outbreak of Afghanistan War does call for debt contracts with looser covenants, the coefficient of the interaction term γ_2 should be negative. In all of our main analysis, we control for year and industry (two-digit SIC) fixed effects. We handle the problematic standard errors very carefully. In the main analysis, we adjust the standard errors by clustering it at the firm level, following the scrutiny pointed out by Bertrand, Duflo, and Mullainathan (2004). In unreported analysis, we try another approach and the main results remain qualitatively the same[17].

Just like other event studies, our experiment also faces a selection on the window length. The ideal window would be a short time period around the outbreak of the war. However, firms usually do not borrow loans frequently enough to allow for a narrow enough window. A long event window retains a larger sample size while bringing the concern that other unrelated events may contaminate our results. It is especially so since there are two recessions during our sample period, i.e. the dot-com bubble (and crash) and the sub-prime mortgage crisis. In the main analysis we choose the period from 1996 to 2012 as the sample period, with 1996 to 2001 as the period when defense spending creases increasing. We will provide further discussions on the window length in section 4.3 and show that our results are robust to alternative window lengthes.

[17]We also tackle autocorrelation of loan covenants within the firm by taking the average of covenant intensity for a certain firm both before and after the war. After this transformation, any individual firm only has one observation before and after the war by construction. Since the dependent variable is not necessarily a count variable, we use OLS instead of poisson regressions.

A crucial assumption in a difference-in-difference analysis is that the treated firms would have followed the same trend as the control group had there been no treatment. In empirical studies, we cannot observe the counterfactual outcomes. Therefore, whether the two groups of observations follow a similar trend in terms of loan covenant intensity just before the war becomes critical for the validity of our DID strategy. As can be seen in figure 3, the number of covenants of loans borrowed by defense and non-defense contractors does follow a similar trend before the outbreak of war[18]. Also in section 5.2, we control for the possibly different trend between defense contractors and the control group to eliminate any contamination that caused by trend differences[19].

4 Empirical Results

We first graphically demonstrate how loan covenants for defense contractors evolve during the sample period from 1997 to 2012. Figure 3 reveals that the trend of covenant intensity is quite close before 2001[20]. Starting from 2002, the covenant intensity of defense contractors begin to diverge from that of non-defense contractors and the difference becomes even bigger in 2003. The use of covenants in the rest part of the sample period is quite similar between these two groups. We also do a univariate comparison between the changes of covenant intensity of the treated and that of the control group. Before 2001, defense contractors have 0.27 fewer loan covenants than non-defense contractors. However, this difference climbs to 0.66, with a 0.39 increase.

4.1 Baseline Results

Results from poisson regressions are shown in table 3. Columns (1)-(3) use non-defense contractors as the control group and the rest of columns use defense firms' industry peers as

[18]The covenants by industry peers also exhibit a similar trend before the war as that of defense contractors. We apply each of our analysis on both the non-defense contractor group and the industry peer group. If the result from the industry peer group is not displayed in the paper, it can be found in the online appendix.

[19]The pioneer study using diffs-in-diffs by Card and Krueger (1994) demonstrates the importance of controlling for different trends between the control and treatment group to quantify the treatment effect.

[20]Due to the unreliable covenant information before 1996, the starting year in figure 3 is 1996. A look at loan covenants before 1997 does show that these two group of firms have quite similar covenant use in their loan agreements.

the control group. We begin by including only the interaction term along with the defense dummy and the post-2001 dummy, controlling for lending standards in the C&I loan market and industry as well as year fixed effects. From column (1), we find that the DID coefficient γ_2 is negative and statistically significant. The estimated marginal effect (evaluated at the mean) implies that defense contractors on average have a decline of the number of loan covenants that is 0.49 larger than that of their non-defense counterparts. This decline is about 12% of the mean and 19% of the standard deviation of the number of covenants for defense contractors before the war, meaning that it is also an economically significant effect. From the univariate comparison of changes in the number of loan covenants between defense and non-defense contractors, we observe that defense contractors have an insignificant drop in the number of covenants used in loans borrowed while non-defense ones have significantly more covenants during the post-war period.

Column (2) includes firm characteristics into the regression to control for simultaneously changing firm fundamentals that confound the effects of interest. The firm-level controls are consistent with previous empirical research on the determination of covenant intensity. In general, larger firms, firms with less debt, higher market-to-book ratio and firms with relatively more assets in tangible forms have fewer covenants when they borrow from banks. The coefficient of profitability which seems to be contrary to intuitions is consistent with what's found by prior literature. The coefficient of the interaction term remains significantly negative with a very similar magnitude to column (1), meaning ignoring possible changes in firm fundamentals does not lead to a biased estimate of γ_2. We control for additional loan characteristics in column (3) which forms the baseline result of this paper. The effect is economically meaningful as a-standard-deviation increase in (log) firm size leads to a decline in the number of covenants which is as small as 0.29. If we only consider a drop in leverage, the effect is only around 0.13. In general, the estimated coefficient is smaller than what's obtained in column (2) and column (1). This decline highlights the importance of controlling for relevant loan characteristics that are also correlated with firm fundamentals[21]. However, a caveat here is that introducing these loan characteristics also brings in *endogeneity* concerns

[21]For instance, as we will further explore in section 5.4.2, defense firms are more likely to borrow loans with smaller amounts. Given that smaller loans contain fewer covenants, neglecting the effect of loan size will overstate the effect of growth opportunities on covenant intensity.

since these contractual provisions are very likely to be determined simultaneously.

Column (4)-(6) uses industry peers as the control group. An univariate difference-in-difference generates an decline of covenant intensity as large as 0.55. A DID poisson regression yields a decline that is slightly smaller. In column (4), we find that defense contractors negotiate away 0.41 covenant post-war. A similar decline is found in column (5). However, the result become insignificant if we further include loan characteristics into the regression in (6), illustrating the importance of the simultaneous change in other aspects of bank loans after the war.

The effects we've pinned down from this quasi-natural experiment illustrates the importance of contractual arrangement in firms' effort to resolve under-investment problem. Typically firms resolve the under-investment problem related to risky debt financing by reducing leverage, as pointed by Myers (1977). Another way of mitigating this problem is to refinance existing debt with new debt. Gilson and Warner (1998) find that firms replace existing restrictive bank debt by junk bonds as a response of high growth opportunities. That being said, our results thus provide a causal relationship between the growth opportunities and firms' contractual resolution of under-investment. In this sense, our results can be taken as an "*intensive margin*" of growth opportunities' effect on firms' debt policies.

4.2 Which covenants matter?

The previous analysis treats loan covenants as a lump-sum restriction. However, different covenants cope with different types of agency problems in debt financing (Smith and Warner (1979)). The efficiency implications for certain types of covenants might be especially important when firms see more growth opportunities. For instance, restrictions on dispositions of the proceeds from asset sales might make it difficult for firms to pursue valuable growth options. Divestitures as well as acquisitions are typical strategies at the disposal of firms when they redefine their investment set and make changes as a response to changes in growth options (Klasa and Stegemoller, 2007). In this section, we examine the change of the composition of both negative (sweep) and financial covenants to shed some light on how firms (as well as creditors) relieve debt contractual restrictions as a response to increased growth

opportunities.

In panel A of table 4, we replicate the baseline regression with dependent variable being the intensity of a subset of covenants. Specifically, we count the number of sweeps and financial covenants separately. We also generate a measure of the tightness of financial covenants which is defined as the standardized "slack" of the tightest financial covenant of a loan[22]. Only for sweeps do defense contractors have a significant decline. The overall intensity of financial covenant—no matter it is the number or the tightness—does not have a significant decline post-war. This implies that negative covenants might be a bigger concern for firms in pursuing growth opportunities than financial covenants.

4.2.1 Negative covenants

We next look at specific negative covenants (sweeps). In total, there are six types of sweeps coded by DealScan which have been investigated in previous literature such as Bradley and Roberts (2004) and Hollander and Verriest (2013). Included are dividend payout sweep, asset sales sweep, debt issuance sweep, equity issuance sweep, insurance proceeds sweep and excess cash flow sweep. Each of them, once written into a loan, specified a proportion of proceeds from the corresponding corporate activities that must be used to repay current debt. These sweeps have been documented to be able to effectively restrict the operational and financial policies[23]. Following previous literature, we construct a dummy variable for each sweep which is equal to one if a certain type of corporate activities are restricted by the sweep. A probit model is specified to estimate the differential effect of the war on the treated and control firms.

$$Pr\left(d\_cov_{it}\right) = \Phi\Big(\alpha + \eta_1 Post_t + \eta_2 Post_t * Contractor_i + \eta_3 Contractor_i + \sum_{j=1}^{p} \beta_j x_{ijt} + \epsilon_{it}\Big)$$

in which Φ is the standard normal cumulative distribution function and X is a vector of variables regarding relevant firm and loan characteristics. The dependent variable d_cov_{it}

[22]How it is calculated is presented in Appendix I. Our measure follows Murfin (2012) except that we do not take into account the correlation of financial ratios over time.

[23]See Huang (2009) for how "excess cash flow" sweep restrict firms debt repayment schedule, and Li (2013) for debt issuance sweep alleviate managerial risk-shifting.

is equal to one if one specific covenant is included in the loan agreement. η_2 is again the coefficient of interest which gauges the extent to which the unexpected increase in growth opportunities differently affect the covenant usage for defense contractors relative to the control group.

Panel B of table 4 reports the maximum likelihood estimates of the marginal effect from the probit regression. Non-defense government contractors are used as the control group. Results are quite similar if we use industry peers as the control group. First, the $defense$ dummy is not significant, which implies that defense and non-defense contractors are not different in terms of the use of sweeps before the war. There is no significant changes in dividend restrictions as shown in column (1). The coefficient estimate in column (2) reveals that on average the likelihood of including an asset sales sweep declines by 11% more for defense contractors. Consider that the unconditional likelihood of having an asset sales sweep is 35% during the pre-war period, this differential effect represents a substantial relative decline in restrictions on asset sales. Firms with an unexpected increase in growth opportunities tend to have more flexibility to sell assets and thus negotiate away restrictions on asset sales. This finding is in line with Kahan and Yermack (1998). They find that once there are convertibility options tied to a bond, covenants on sale of assets are basically absent. Often firms with good prospects choose to have convertible debt options implanted. In the sense that asset sale activities of firms with high growth opportunities are value-enhancing (Bates, 2005), relaxing asset sale restrictions is consistent with minimizing the inefficiencies from covenants.

Defense contractors also receive relatively less restrictions on debt issuing activities. The average decline in the likelihood of debt issuance restriction is 10%, equivalent to a reduction that is nearly 40% of the unconditional probability pre-war. This is consistent with the empirical findings by Nash, Netter, and Poulsen (2003) who demonstrate that new bond issues contain fewer debt financing restrictions when the issuer has more growth opportunities. However, our studies are also different from theirs in several respects. First, the quasi-natural experiment used here helps us to establish a causal relationship between growth opportunities and the use of covenants. Second, instead of focusing on bond covenants, we investigate how bank loan covenants change as a response to a shock to growth opportunities. As documented

in prior literature, bank loan covenants are more effective in mitigating moral hazard and in enhancing corporate governance due to various differences between these two securities[24]. Therefore, bank loan covenants should stand as the most binding contractual restrictions which the firms desire to negotiate away facing up with higher growth opportunities.

Firms also seem to have more discretion in selling new shares to the market. Our result in column (4) indicates that on average it is 9% less likely that defense contractors will be restricted. This is consistent with the larger amount of equity issuing activities after the war by these firms and also the decline of leverage ratio, as discussed in section 3.1. Note that our results here differs substantially from that obtained by Goyal, Lehn, and Racic (2002) who find that firms build up debt following a decrease in growth opportunities while the net equity issues do not change significantly. In other words, it seems that firms respond to higher growth opportunities by issuing equities and respond to lower growth opportunities by issuing debt. Discussing whether this is a result of market timing documented by Baker and Wurgler (2002) is out of the scope of this paper. However, our results do show that firms contractually adapt the adjustments of capital structure.

Column (5) shows that firms also gain more flexibility in using the proceeds from insurance. The changes of restrictions on dividend payout or excess cash flow are not significantly different for defense contractors. This is in line with what is found by Huang (2009) who show that there is no discernible relationship between Tobin's Q and the inclusion of excess cash flow sweeps. Bringing all of the findings together, we can come to the conclusion that firms tend to negotiate away restrictions on external financing and gain more flexibility in the usage of cash flow as a response the increased growth opportunities.

[24]Bondholders suffer from possible coordination failures (Amihud, Garbade, and Kahan, 1999; Bienz, Faure-Grimaud, and Fluck, 2011). As a result, bond contracts rely more on event-triggered covenants and do not have financial covenants (Kahan and Tuckman 1993; Nini, Smith, and Sufi 2012). Bond covenants thus only become effective when certain events are initiated such as a change of control. Asquith and Wizman (1990) document a large wealth loss for bondholders in LBOs, especially when they are not protected by a change in control covenant.

4.2.2 Financial covenants

The above analysis has already shown that there is no significant changes on the overall intensity of financial covenants. In this section, we look into the composition of financial covenants and hereby try to study which types of financial covenants are declining in use. There are in total 21 financial covenants, restricting different accounting ratios. Since some of them share the same function, we classify them into 6 major categories, namely investment, leverage, profitability, coverage, liquidity and net worth covenants. How we categorize financial covenants in be found in Appendix I. The dummy variable is equal to one if the loan has at least one covenant restricting a specific type of activities. For instance, if one loan has a covenant restricting the debt-to-equity ratio, the dummy variable indicating the existence of leverage covenants takes the value of one.

Panel C of table 4 presents the result. Defense contractors only have significantly fewer covenants restricting investment. Here the investment related covenant refers to capital expenditure restrictions. On average, defense contractors becomes less likely to borrow loans with a capital expenditure restriction by 6% after the war. Using the market-to-book ratio as the proxy for growth opportunities, Nini, Smith, and Sufi (2009) find similar results[25]. While they highlight the role of capital expenditure restrictions in resolving conflict of interest between creditors and shareholders, our paper shows that the cost associated with restrictions on firm investment goes up with firms' growth opportunities. This finding echoes a recent paper by Lowery and Wardlaw (2012) who model the use of investment restrictions in debt contracts and find that these covenants may inefficiently prevent firms from pursuing their growth opportunities. Therefore, firms tend to negotiate away investment restrictions as they have more valuable growth options. This finding shares the spirit with a recent paper by Mariano and Tribó (2012) who shows that the reduction in investment is less when the covenant-violating firm enjoys higher growth opportunities. We cannot find a significant decline for the other five types of financial covenants[26].

[25]Note that Nini, Smith, and Sufi (2009) also include credit rating in their probit model on the existence of capital expenditure restrictions. Our results are robust to controlling for credit rating fixed effects.

[26]In untabulated results (in the appendix), we run probit regressions on all 21 financial covenants separately. Still we find that defense contractors have less restrictions on capital expenditures. However, they do receive more restrictions on firm net worth. The result on different coverage restrictions is mixed. While

It is non-trivial to fully gauge the restrictiveness of financial covenants, partially because how the ratios are defined is quite customary and also because the threshold of each covenant is not set independently. Previous research mostly picks out covenants whose financial ratios are calculated in a uniformed manner, such as total debt to EBITDA covenant and net worth covenant as in Demiroglu and James (2010) Roberts and Sufi (2009a). Instead of focusing on the initial tightness of financial covenants, we examine the build-up of covenant threshold, a new feature which does not receive much attention in the literature[27].

We select the six most commonly used financial covenants in bank loan contracts, namely total debt to EBITDA, interest coverage ratio, fixed charge coverage, leverage ratio, debt to tangible net worth and senior debt to EBITDA. The trend of the threshold is *decreasing* if the threshold of a certain covenant is declining during the loan maturity and is *increasing* if the threshold is getting higher since initiation. To make it easier to interpret, the dummy variable being equal to one indicates that the covenant is getting tighter. Specifically, we set the dummy equal to one if the threshold is decreasing for total debt to EBITDA, leverage ratio, debt to tangible net worth or senior debt to EBITDA ratio, meaning that banks require the firm to deleverage during the loan maturity. It is equal to zero if it has a fluctuating or increasing trend. For interest coverage and fixed charge coverage ratios, it is equal to one if they have an increasing trend, meaning that banks require increasingly higher coverage. A probit DID specification with a full set of control variables are used to capture the choice of using build-up in financial covenants.

The estimated marginal effects using a probit DID regression are shown in table 5. In most specifications, the coefficient is negative, though we don't find it statistically significant in every specification. For instance, the probability of having a tightening total debt to EBITDA financial covenant declines by 15.6% after the war for defense contractors, conditioning on having such financial covenants in loan agreements. As is shown in column (2), banks become 11.4% less likely to include a build-up for the interest coverage covenant when they lend to defense contractors after the war.

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they receive less restrictions on fixed charge coverage after the war, they borrow with interest coverage more often.

[27]The few exceptions include Li, Vasvari, and Wittenberg-Moerman (2012), Freudenberg, Imbierowicz, Saunders, and Steffen (2012) and Wang and Denis (2013).

Our results therefore imply that banks put less restrictive financial covenants when lending to defense contractors after the war. Specifically banks become less likely to put restrictions on firm investment and also less likely to tighten up financial covenants post-initiation [28].

4.3 Placebo test

There are several potential concerns about the empirical strategy of this paper. First, it is very close to the credit boom between 2003 and 2007, making it unclear whether the effect is due to cheap credit and thus loose lending or the war itself. Second, even though the terrorist attack on September 11 is unexpected, the decision on going into war and moreover the timing of the war could not be free from any involvement of interest groups. For instance, the escalation into a war could be accelerated by the desire of the local defense industry to gain from new technologies which boosts firms' growth opportunities. Besides, the observed difference in covenant use could well be a consequence of uncommon trend pre-war.

We propose a placebo test with artificial treatment timing and a rolling-window sample. For each artificial treatment year, we include two years before and two years after as the analysis sample. Table 6 shows the result. The most important finding is that the interaction term becomes significant only in 2001. Figure 4 provides the evolution of the estimated marginal effect of the interaction term. We plot the estimated marginal effect as well as its 95% confidence interval. The marginal effect is only significantly negative when the cutoff year is chosen to be year 2001. Compared with year 2000 and 2001, defense firms borrow with significantly fewer covenants and the difference is 0.7. We obtain very similar results if we select one or three years around the artificial cutoff years and also if we keep the original sample with just alternative cutoff years. For brevity, the results are not reported.

This finding implies that our empirical specification pinpoints the timing of the treatment. Besides, the timing of the war is not likely to be an outcome of political influence exerted by the defense industry. The reason is that we would have observed a negative effect even before the war if the timing of the war were the result of US defense industry's political effort

[28] A natural implication is that defense firms will become less likely to violate covenants as violations are almost always a result of breaching financial covenants. However, untabulated results show that defense firms are equally likely to report a violation post-war which seems to be counter-intuitive. One plausible reason is that covenant restrictions are defined in equilibrium.

to realize its increasing growth opportunities. Credit cycle might not be a concern here since our post-treatment period does not include 2004 when the credit boom really begins. The possible bias as a result of credit cycles is further attenuated given we still obtain a significant estimate if we choose a one-year window.

It is also important to bear in mind that our results using artificial treatment years support the common trend assumption. A critical assumption in DID strategy is that the treatment and control group would have followed the same trend had there been no treatment. A useful approach to investigate this assumption is to look at multiple periods (Angrist and Pischke, 2009). The fact that the difference in the trend of covenant intensity is insignificant across the sixteen-year period strongly indicates that the control group has successfully provided a counterfactual scenario to the treatment group.

Lastly, the markedly different coefficient estimate between year 2001 and other artificial treatment years indicates that the observed decline of covenants comes from a shock to growth opportunities rather than increased current revenue. Recall that military spending and also the revenue to defense contractors keeps increasing in the years after 2001, as shown in figure 1. Anecdotal evidence further substantiate the channel of growth opportunities.

4.4 Who benefits more?

Having established that firms faced up with higher growth opportunities shy away from covenants, we then provide some interaction test to justify possible channels through which growth opportunities affect covenants. We explore three channels, namely the value of flexibility in the product market, the information asymmetry and the financial flexibility.

4.4.1 Product market environment

Firms that operate in a diversified set of industries or regions, firms in more competitive markets need more flexibility in response to higher growth opportunities. The first measure of product market environment is division dispersion which has been used in Duchin and

Sosyura (2013). It is defined as follows.

$$Division\ \ dispersion = \frac{(\#\text{ Segments with unique 2-digit SIC codes} - 1)}{\text{Total number of segments}}$$

It measures the fraction of segments that operate in industries with non-overlapping two-digit SIC codes. The lower bound is zero, meaning that all segments are operating in a single two-digit SIC industry. One drawback of this measure is that it can never be equal to one when every segment is operating in a different industry. However, it suffices to capture the cross-sectional variation. Firms whose division dispersion is larger than zero are defined as diversified firms. The second measure is whether the firm has a foreign segment. The third is Herfindahl-Hirschman Index (HHI) which is calculated using firm sales in Compustat and is defined on the three-digit SIC industry level[29]. Firms operating in competitive industries are those operating in three-digit SIC industries with HHI below the median. Less competitive industries are defined vice versa.

Table 8 presents the results on sub-samples formed on similar product market environment. Column (1) contains firms with low division dispersion and (2) is for firms with high dispersion. Consistent with the conjecture that firms for which being flexible is more valuable get ride of covenants, the decline of loan covenants is only significant for firms with dispersed divisions. The Chi-square test indicates that the response to increased growth opportunities is marginally significantly different. Column (3) and (4) divide the sample according to the existence of foreign segments. Firms with at least one foreign segments tend to borrow with fewer covenants after 2001, compared with domestically operating firms. We last partition the sample according to product market competition. Firms with more competition pressure from their industry rivals tend to value flexibility more, as is shown by Bolton and Scharfstein (1990), Hoberg, Phillips, and Prabhala (2014), among others. From the last two columns, we find this is indeed the case. Firms in more competitive industries, as measured by a low HHI, borrow from banks with significantly fewer covenants as a response to increased growth

[29]We drop those industries which contain less than 5 firms to ensure a precise measure of competition. Recent research has pointed out the limitations of relying on Compustat data in calculating HHIs, such as Ali, Klasa, and Yeung (2009). However, we cannot use other available measures of competition, such as fitted HHI (Hoberg and Phillips, 2010) and fluidity (Hoberg, Phillips, and Prabhala, 2014), due to the sample concern.

opportunities. Firms in concentrated industries do not reduce covenants post-911 and the response for these two groups of firms is significantly different at the 5% level.

4.4.2 Information asymmetry

As demonstrated in Houston and James (1996), the private information held by the incumbent bank lender which cannot easily be communicated with external financial market can be taken advantage of to hold up the firm. James then show that the "hold-up" problem gets more severe when firms' growth opportunities are higher, making firms shy away from bank debt. In the sense the covenants facilitate the control by banks, more opaque firms tend to get rid of covenants when faced up with higher growth opportunities[30]. Besides, as we have argued earlier, one important reason why covenants involve a lot of contracting costs is its dependence on imperfectly measured firm performance information. With increased growth opportunities, more opaque firms favor covenants less since the efficiencies due to imperfect technical default trigger are larger for these firms. Our first measure is the number of analysts. The second measure of information asymmetry is the dispersion of analyst earnings forecast. We extract analyst earnings forecast from I/B/E/S. Analyst forecast dispersion is defined as the standard deviation of earnings forecast scaled by the absolute value of the earnings forecast, following Diether, Malloy, and Scherbina (2002).

From table 9, we find that young defense firms have a significant decline in covenant usage after 2001. The change of covenant intensity between the old defense firms and the old non-defense firms is not significantly different. Also in the unrated sample, firms tend to use one less covenant as a response to increased growth opportunities. However, there is not any significant decline of covenant usage for rated firms. The last two columns are for firms with high and low analyst forecast dispersion. The sample size shrinks to 738 due to the availability of forecast dispersion data. Consistent with our expectation, firms with higher analyst forecast dispersion have a much larger reduction in covenant intensity. In sum, all

[30]Prilmeier (2011) argues that covenants tend to facilitate relationship banks' holding up the bank-dependent borrower. Actually from the lenders' point of view, relaxing covenants to enables the banks to gain the upside of the projects partly through more loans in the future as firms with borrowing relationship are significantly likely to obtain future loans from their relationship banks, shown by Bharath, Dahiya, Saunders, and Srinivasan (2007).

the results are broadly consistent with opaque firms mitigating the "hold-up" problem by negotiating away covenants when growth opportunities suddenly increase.

4.4.3 Financial flexibility

Financial flexibility often refers to firms' ability to avoid distress when faced up with negative shocks as well as the cost of raising financing when profitable opportunities arise (Gamba and Triantis, 2008). In the context of ours, financial flexibility becomes valuable when the firm is less restricted to reach external financial market in order not to bypass positive-NPV projects. In this section, we examine whether the increase in growth opportunities has a larger effect on firms that may need more financial flexibility. Specifically, we look at the differences in the coefficient estimate of the interaction term $Defense \times post2001$ between sub-groups formed on the value of financial flexibility. Industry-adjusted leverage is the difference between the leverage ratio of the firm and the average leverage of firms in the same three-digit SIC industry the firm belongs to. The second measure is tangibility. The more tangible the firm's asset is, the more debt capacity the firm owns. The third measure is inspired by Sufi (2009) which demonstrates that the level of firms' cash flow determines the availability of bank lines of credit. In the sense that having access to credit lines means more financial flexibility, we expect that firms with less cash flow benefit more from the increase in growth opportunities. We also divide the sample by Altman's Z-Score (Altman, 1968). The last measure is whether the borrower is a dividend payer[31]. Firms choosing to repurchase retain more financial flexibility, according to Jagannathan, Stephens, and Weisbach (2000).

The results are shown in table 7. Generally they support the conjecture that firms in need of more financial flexibility have a larger decline in covenants. Previous studies such as Graham and Harvey (2001) have shown that financial flexibility is of first-order importance. In a broader sense, our result shed light on how firms preserve financial flexibility through loosening debt contractual restrictions.

Note that our results further indicate that firms' bargaining power in seizing external

[31]Note that we do not use the popular measures for financial constraints. According to a recent study by Farre-Mensa and Ljungqvist (2014), conventional measures for financial constraints cannot pick out firms that are in real constraints.

financing is not behind the decline of debt covenants. Roberts and Sufi (2009a) find that the decline in net debt issuing activities after covenant violation is larger when the firms' market to book ratio is relatively low. They further attribute the larger decline to these firms' inability to seize alternative sources of capital with favorable terms. Here a low market-to-book ratio represents a less favorable equity market for the firm. Unlike the violating firms in Roberts and Sufi (2009a), our sample firms are staying away from "bad state" of performance in which creditors have to protect their stakes through control rights. On the contrary, defense contractors are expecting higher cash flow and more investment opportunities in the future. Therefore, creditors are willing to loosen the covenants of firms with less financial flexibility in order to minimize the efficiency loss from bypassing valuable projects as a result of inadequate financing.

5 Robustness

In this section we present some robustness test to show that our results hold for alternative sampling methods and different definitions of the treated group. Also we show some supplemental evidence on other loan terms, considering the possibility that loan contract terms are almost always jointly determined.

5.1 Matched Sample

The critical assumption in a difference-in-difference strategy is that the treated group would have followed the same trend with the control group had there been no treatment. One concern about our empirical strategy is that firms in the control group might be fundamentally different from firm in the treatment group. We therefore employ a propensity score matching to help us pick out a more comparable control group.

One permanent empirical challenge when the sample contains individual bank loans is the imbalance of borrowing by firms. A matching technique is flawed here due to the fact that not every firm borrow every year, but also that firm may borrow for multiple times in a certain year. Compared with matching on the firm level, a loan-level matching suffers

less from this special sample structure[32]. Note that loans borrowed by the same defense contractor are now treated as independent loans and could be matched to loans borrowed by several different firms. We therefore cluster the standard errors on the firm level.

We match directly on the level of loans which are borrowed by the defense contractors and other firms (including other contractors) from 1996 to 2012. We allow up to a maximum of two control firms to be assigned to each of the treated firm. The variables used to match loans include all the nine control variables in our baseline regression. We match on the propensity score derived from the probit regression of the *defense* dummy on the matching variables. Finally a total of 889 "treated loans" can find at least one matched loan from the loan pool borrowed by other firms. Out of loans borrowed by other firms than defense contractors, we successfully pick out 1505 loans to form the control group. Therefore, we have approximately 1.7 non-defense firms (loans) matched to a single defense firm (loan). For brevity, the diagnostic test results are not shown. Firm size, market-to-book ratio, profitability, relative loan size and maturity are insignificantly different between the treated and control group.

Panel A in table 10 examines the total number of covenants. We observe relative to matched firms, defense contractors borrow with 0.43 fewer covenants which is just slightly small than what we obtain from the baseline regression. For general covenants, we do not find a significant decline after war. Panel B and C investigate the compositional change in general and financial covenants respectively. Again, firms seem to have less restrictions in issuing equity. Besides, defense contractors are 7% less likely to have investment restrictions and are 4% less likely to have liquidity-related restrictions. The rest restrictions only have a insignificant decline. Panel D compares the use of build-ups in financial covenants before and after war. We find that defense contractors are less obliged to build up their interest coverage after they borrow from banks to maintain liquidity solvency and this decline is as large as 13%. Different from the corresponding results in table 5, the build-ups in debt-to-EBITDA ratios do not decline significantly. In general, our matching DID confirms the

[32]One drawback of matching on the firm level is the different timing and intensity of borrowing. For instance, firm A (control) is matched to firm B (treated) at the beginning of our sample period. However, they borrow in different years and with different intensity. Firm B might borrow heavily in 2002 in response of increasing growth opportunities. Firm A, however, only starts borrowing in 2004.

conclusion from the baseline analysis, indicating that firms do negotiate away covenants in new bank loans compared with a comparable sample of firms.

5.2 Alternative channels

Even though we have shown both through anecdotal evidence and a regression-based analysis that the growth opportunities have an unexpected increase with the inception of war, we still cannot completely rule out other possible channels that might be driving our results. One channel which is not mutually exclusive to increased growth opportunities and is also able to explain what we observe is the "demand shock" received by our treatment group. Admittedly, our empirical approach cannot identify the effect of growth opportunities net of that of immediate demand shock. However, several empirical findings reveal that the demand shock might not dominate the growth opportunity channel. First, it seems that it is the changed anticipation about future contracts from DoD rather than the demand *per se* that causes the decline of covenants. As is shown in 1, the increased procurement contracts received by defense contractors persist after the war till 2008. If the demand shock dominates the growth opportunity channel, we would observe a similar covenant decline in each year after 2001. Since our placebo tests show that only in 2001 can we find a significant decline, growth opportunities are probably the dominating force. Second, instead of becoming more profitable, the defense contractors are found to generate less cash flow (EBITDA/Assets) after the war[33].

We first consider that the possibly better credit quality has given defense contractors more leverage when borrowing from banks. We include in column (1) in table 11 the S&P rating fixed effects into the baseline regression and still find a significant result. The column (2) in table 11 tests whether our results suffer from the concern from the lobbying activities in the defense industry[34]. Actually firms might contribute to political campaign to benefit on higher

[33]The profit margin (net income/sales) of defense contractors also decreases by 3% when compared with non-defense contractors and 7% compared with industry peers.

[34]Although lobbying expenses on the whole defense industry level do not exhibit significantly different changes around the war compared with other industries, firm-level lobbying activities might still drive our results. In a press report on October 9, 2009, Stephen M. Walt raised several doubts about the legitimacy of the War of Afghanistan and later Iraq. He mainly refutes the view that lobbying is not an influencing hand behind the military intervention of United States in these two countries.

probability of receiving government procurement contracts, according to two recent papers by Goldman, Rocholl, and So (2013) and Tahoun (2014). Arguably, it is not quite likely that our results are driven by lobbying activities of the local defense industry. We've already shown in section 4.3 that no effect can be detected before 2002. To further ameliorate the concern that lobbying by specific firms might have an effect, we retrieve information about lobbying expenses of firms in our defense contractor sample from Center for Responsive Politics to pick out firms who lobby. Then we drop the 9 largest firms in terms of lobbying investment during the period 1998-2013. Note that these firms are also ones receiving the largest contracts from the DoD and ones who are most likely to benefit from the war. We find that our results are quite robust to excluding top lobbying firms.

We then examine the differential effect of the war on firms within the defense contractor group. The whole sample is therefore divided into two sub-samples based upon the industries firms operate in. From column (3) and (4), we observe that the effect is not only more significant but also larger in magnitude for firms in non-manufacturing industries[35]. The differential effect is highly in line with the changes in outsourcing practice by the DoD during the war. Starting in early 2000, DoD gradually shifts the reward to defense-related service providers to outsource services such as logistics, communications, IT, etc. Therefore, it is not surprising that service providers are willing to gain more flexibility since they see more growth opportunities after the war.

Another concern is that our findings might be a result of firms with certain characteristics more likely to bargain for favorable terms after the war. Therefore, the rest of columns in A2 interact several important firm characteristics with a $post2001$ dummy. Column (5)-(10) add each single interaction term into the baseline regression and the last column collects all new interaction terms. We do find that firms with higher stock prices, larger size and higher profitability are more likely to receive light covenants. However, in all specifications, the basic interaction term is still significant, indicating that the baseline result is robust to considering alternative channels.

[35]Defense contractors along with non-defense counterparts with an SIC code between 2000-3999 will be defined as manufacturing firms. The non-manufacturing sample is defined vice versa.

5.3 Potential contractors

One potential concern of our treated group definition is that firms which received a huge amount of defense contracts not only enjoy higher growth opportunities, but also favorable changes on other aspects, such as product demand[36]. An ideal sample should contain those firms that keep the "potential" of generating future cash from by receiving government orders. However, it is impossible to exhaust all defense-related firms. We therefore search the self-reported firm *segment* file in Compustat for key words that are most likely related to defense products or services. Specifically, a firm is defined to be a defense-related firm once its business segment description contains the word "defense", "military", "missile", "weapon", "ammunition", "armor", "ballistic", "battle", "bomb", "bullet", "fighter", "firearms", "helicopter", or "radar". Obviously this approach is flawed in the sense that it is not possible to exhaust all firms with defense-related business. The two control groups are still non-defense contractors and industry peers of firms in our new sample. There are 1228 loans borrowed by defense-related firms, out of which 558 have valid covenant information.

We replicate the DID analysis on this new sample and the results are reported in table A3. As is shown in Panel A of the table, the number of covenants in an average loan borrowed by defense-related firms has a larger decline after the war by 0.9, compared with non-defense contractors. For general and financial covenants, the corresponding number is 0.5 and 0.4 respectively. Panel B consider defense-related firms' SIC3 industry peers as the control group. Table A3 also examines the compositional changes of covenants and the finding is largely similar with what we obtain using the initial sample. All in all, results from this alternative sample confirm what we find earlier. Firms which have the "potential" of generating extra cash flow from the unexpected war benefit by borrowing with fewer covenants.

[36]Even though we have partly taken into account the demand shock channel in section 3.1, it is still a challenge to our empirical setting.

5.4 Further Discussions

5.4.1 Creditor Actions Post-violation

All the above analysis takes an *ex ante* perspective in that we only examine whether creditors forsake control rights through writing less covenants when there is a positive shock to firms' growth opportunities. However, another channel of forsaking control rights is to exert less influence on firm policies upon covenant violations. Previous studies have shown that creditors use the rights of accelerating payments and withholding future financing to influence firm policies (Nini, Smith, and Sufi, 2009; Nini, Smith, and Sufi, 2012). Following Roberts and Sufi (2009b), we examine the changes in firm policy after covenant violations and estimate the following change model.

$$\begin{aligned} Y_{i,t} - Y_{i,t-2} &= \beta_0 + \beta_1 \text{Defense}_i + \beta_2 \text{Defense}_i \times \text{Post2001}_{t-2} + \beta_3 \text{Post2001}_{t-2} \\ &\quad + \beta_4 \text{SubsequentViolation}_{i,t-1} + \epsilon_{i,t} \end{aligned}$$

$Y_{i,t} - Y_{i,t-2}$ is the change in firm policy two quarters after the violation compared with the violation quarter. As in previous analysis, the dummy variable $Post2001$ indicates whether the violation happens after year 2001 and $Defense$ is equal to one if the firm is a defense contractor and zero otherwise. We also look at whether the creditor-enforced change in firm policy is bigger or not if the firm violates covenants in the subsequent quarter. Specifically, we conduct a difference-in-difference analysis on firms' new debt issuance, new equity issuance, investment and tangible assets. Tangible assets are in natural logarithms so that a two-quarter difference can approximate the growth rate of tangible assets, i.e. asset sales intensity. All of these policies have been shown to experience a decline immediately after violations[37].

Column 1 in table 12 implies that the decline in new debt issue of defense contractors is 2.7% less than that of non-defense contractors, conditioning on having violated bank loan covenants. There is no discernible difference in creditor actions on equity issuance,

[37]Whereas firms become more conservative in debt financing and investment, there is little evidence that firms change the equity issuing activities following violations, as shown in Roberts and Sufi (2009b). We therefore examine equity issuing activities here as a validation exercise.

capital expenditures or tangible assets sales upon violations between defense and non-defense contractors. This is not inconsistent with creditors enforcing creditor rights in a small scale in the sense that covenant violations and creditor actions post-violation are based upon optimally set covenant restrictiveness.

In sum, we find that creditor control during the post-violation period results in a smaller decline of debt financing for defense contractors, compared with their non-defense conterparts. With covenants on such firm policies as investment and asset sales loosened *ex ante*, creditor response to violations on these policies does not differ significantly between defense and non-defense contractors.

5.4.2 Other loan terms

Debt contracts contain a handful of terms including not only covenants, but also other equally important provisions. Some of these provisions serve similar purposes as covenants. Our empirical setting enables us to derive a causal effect of growth opportunities on other contractual provisions of newly issued debt. Firms trade off the benefit of short-term debt such as resolving underinvestment problem (Myers, 1977) and more frequency repricing of debt (Childs, Mauer, and Ott, 2005), and the cost from refinancing risks (Harford, Klasa, and Maxwell). Secured debt makes it possible for the firm to finance some projects that are otherwise unable to be financed using only equity or unsecured debt (Stulz and Johnson, 1985). In principle, firms with higher growth opportunities might prefer to use performance pricing more often to facilitate the repricing of debt with changing firm credit risks. However, empirical studies such as Roberts and Sufi (2009b) indicate that performance pricing provisions are not put in place to reduce renegotiation frequency, but to *shape* the renegotiation game ex post. Therefore, it is straightforward to predict the relationship between growth opportunities and the use of performance pricing.

The first column of table A4 reports the relation between growth opportunities and the amount of debt financing which is scaled by borrower's book value of assets. Compared with non-defense contractors, defense-related firms tend to borrow smaller loans. They enjoy cheaper credit from banks, with the all-in-spread-drawn down by 23 basis points. We do

find that firms prefer to borrow on an unsecured basis when faced up with higher growth opportunities. This is consistent with the result of a recent paper by Giambona and Golec (2012) who document a more frequent use of unsecured debt financing by pharmaceutical firms after the passage of a favorable act. The last two columns show the coefficient estimate of regressions in which whether the loan is secured and contains performance pricing provision is the dependent variable. It is observed that defense contractors do not borrow more (or less) secured debt or use more (or less) performance pricing provisions.

6 Conclusion

How debt contracts are designed to mitigate agency cost and further maximize firm value in the context of shareholder-creditor conflicts of interest has drawn much attention in the prior literature. Among all the information about firm performance, growth opportunities are one of the strongest determinants of the restrictiveness of covenants. The reason is that growth opportunities constitute one critical contracting cost of debt covenants which has been discussed long before by Smith and Warner (1979). Our study examines the causal relationship between growth opportunities and loan covenants. The War of Afghanistan is used as the (asymmetric) exogenous shock to firms' growth opportunities. We show that defense firms growth opportunities increase massively relative to firms that are unrelated to the defense business. Following this increase, defense firms borrow with fewer covenants and the decline is around 0.6. Further analysis reveals that the loosening of negative covenants for defense firms contributes to the decline in covenant restrictiveness. Among different negative covenants, asset sale, debt issuance, equity issuance covenants all have a significant decline. On the financial covenants side, firms negotiate away more restrictions on their investment spending and also are subject to less tight covenants after the loan initiation.

We also show that the reduction in covenants is mainly motivated by maximizing firm value via gaining more flexibility in financing and investment. Specifically, firms in need of more financial and operational flexibility enjoy a larger decline in loan covenant restrictiveness after the war. Our results is consistent with lending practices in the financial industry and also contribute to the debt contracting literature. In a broader sense, our results are

related to the control right allocation inside the firm. In sofar as the investment set improves after increased growth opportunities, external control is reduced since the manager is less likely to choose suboptimal courses of action, as in Dewatripont and Tirole (1994). Future studies should focus on how relaxed debt contractual restrictions facilitate firms' investment in positive-NPV projects.

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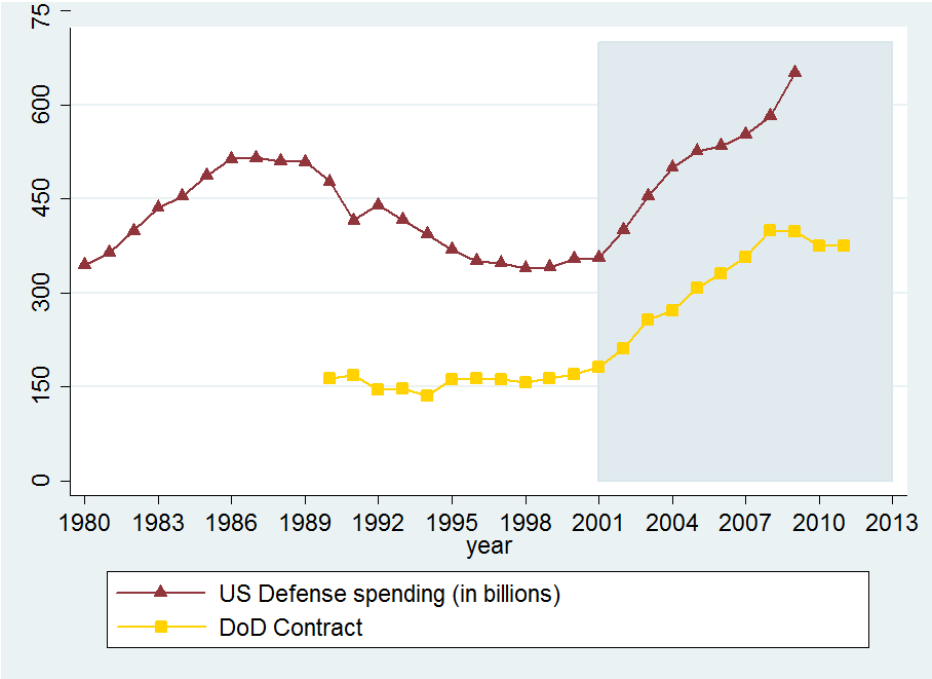

Figure 1: US Defense Spending (1980-2009)

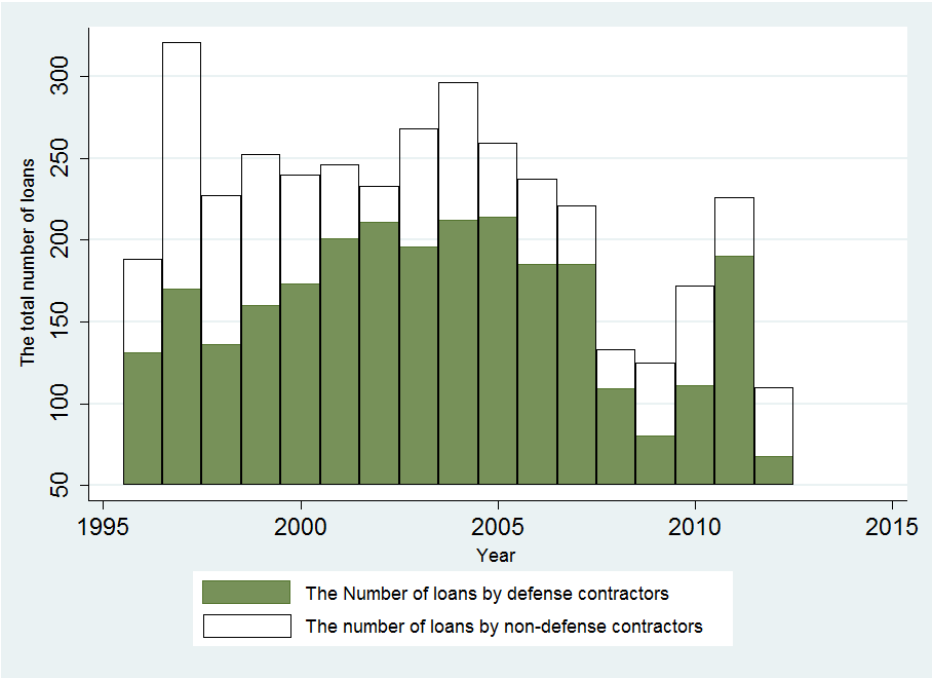

Figure 2: The number of bank loans by defense and non-defense contractors

Figure 3: The number of loan covenants for defense and non-defense contractors

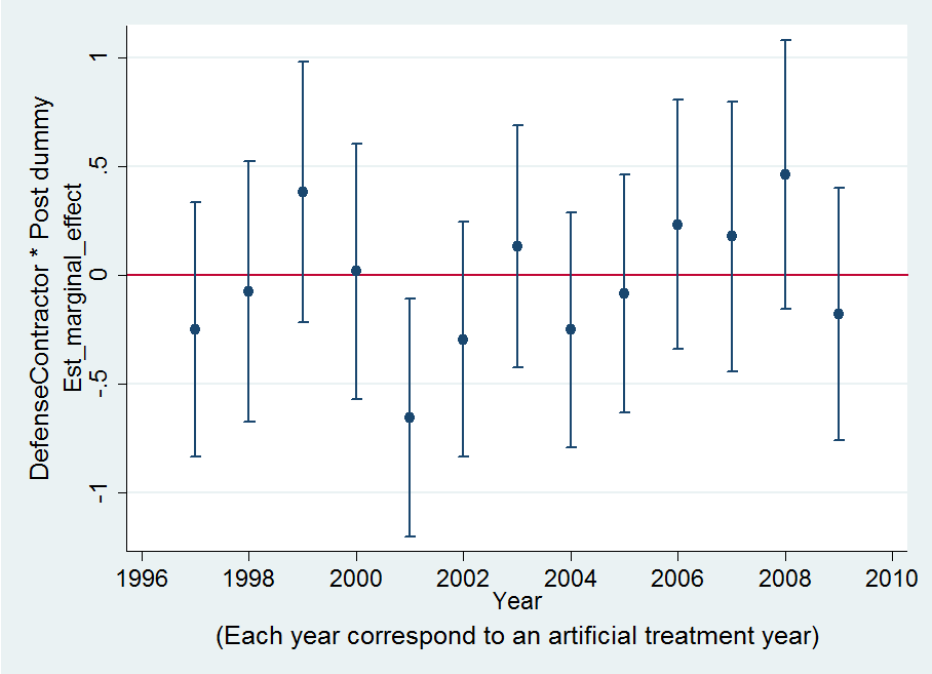

Figure 4: The Estimated Marginal Effect of the Interaction Term and its 95% Confidence Interval This figure plots the estimated marginal effect of the interaction term $Post_t * Contractor_i$ with the year dummy $post_t$ defined based up artificial treatment years. The result of poisson regressions can be found in table 6. Each year on the x-axis corresponds to an artificial treatment year, except year 2001 which is the real treatment year.

Table 1: Summary Statistics

This table presents some summary statistics of the loan sample used in paper. The *treated* sample consists of 209 loans borrowed by defense contractors with available information on core variables. We form two groups of firms as the *control* sample. The first consists of contractors providing non-defense-related goods or services. The second group contains firms in the same SIC three-digit industries with the defense contractors. How these variables are defined can be found in Appendix I.

Sample	*defense contractors*				*other contractors*				*same SIC3 firms*			
Statistics	N	mean	p50	sd	N	mean	p50	sd	N	mean	p50	sd
Panel A: Before 2002												
Assets	295	5694.5	974.8	18408.4	485	1952.9	337.5	6603.6	3016	894.5	194.7	2613.0
Market to Book	295	1.61	1.37	0.84	485	1.99	1.44	1.57	3016	1.98	1.44	1.85
Leverage	295	0.27	0.26	0.17	485	0.35	0.33	0.25	3016	0.31	0.28	0.25
Profitability	295	0.03	0.03	0.03	485	0.03	0.04	0.04	3016	0.02	0.03	0.06
Tangibility	295	0.27	0.21	0.20	485	0.27	0.20	0.20	3016	0.34	0.25	0.26
Cash / Assets	295	0.06	0.03	0.08	485	0.08	0.03	0.12	3016	0.10	0.04	0.16
Cash Flow Risk	295	1.22	0.80	2.73	485	1.55	1.02	1.99	3016	2.04	1.26	3.10
Loan amount / Assets	295	0.28	0.22	0.23	485	0.35	0.29	0.28	3016	0.35	0.27	0.60
Maturity	295	45.9	52.0	26.1	485	46.1	42.0	26.8	3016	44.0	36.0	27.5
Total number of covenants	295	4.2	4.0	2.6	485	4.5	4.0	2.5	3016	4.3	4.0	2.3
Number of financial covenants	295	2.6	3.0	1.4	485	2.8	3.0	1.3	3016	2.6	3.0	1.4
Number of sweeps	295	1.6	1.0	1.7	485	1.7	1.0	1.7	3016	1.6	1.0	1.6
Loan Spread	294	139	109	114	480	185	194	119	2968	200	200	130
Number of Lenders	295	12	7	14	485	9	4	13	3016	5	2	8
Secured (Y/N)	295	0.47	0.00	0.50	485	0.66	1.00	0.47	3016	0.71	1.00	0.45
Performance pricing (Y/N)	295	0.74	1.00	0.44	485	0.63	1.00	0.48	3016	0.53	1.00	0.50
Panel B: After 2002												
Assets	613	11878.91	2387.53	25009.46	820	4461.71	921.42	13962.61	3443	2747.75	672.60	8349.83
Market to Book	613	1.64	1.42	0.76	820	1.72	1.46	1.00	3443	1.74	1.41	1.22
Leverage	613	0.24	0.23	0.16	820	0.30	0.27	0.23	3443	0.30	0.27	0.26
Profitability	613	0.03	0.03	0.02	820	0.03	0.03	0.03	3443	0.03	0.03	0.05
Tangibility	613	0.21	0.16	0.17	820	0.24	0.17	0.21	3443	0.36	0.27	0.29
Cash / Assets	613	0.09	0.06	0.10	820	0.10	0.05	0.11	3443	0.11	0.05	0.14
Cash Flow Risk	613	0.92	0.64	0.86	820	1.03	0.69	1.22	3443	1.70	0.94	3.06
Loan amount / Assets	613	0.20	0.14	0.20	820	0.26	0.20	0.24	3443	0.30	0.22	0.61
Maturity	613	46.2	60.0	21.3	820	50.4	60.0	22.1	3443	47.5	48.0	22.3
Total number of covenants	613	3.8	3.0	2.5	820	4.7	4.0	2.7	3443	4.3	4.0	2.4
Number of financial covenants	613	2.1	2.0	1.1	820	2.4	2.0	1.2	3443	2.3	2.0	1.2
Number of sweeps	613	1.7	1.0	1.9	820	2.3	1.0	2.0	3443	2.0	1.0	1.8
Loan Spread	607	156	135	129	812	218	200	170	3400	211	188	149
Number of Lenders	613	12	9	14	820	8	6	9	3443	7	5	8
Secured (Y/N)	613	0.46	0.00	0.50	820	0.67	1.00	0.47	3443	0.70	1.00	0.46
Performance pricing (Y/N)	613	0.76	1.00	0.43	820	0.70	1.00	0.46	3443	0.65	1.00	0.48

Table 2: How defense contractors' growth opportunities change relative to other firms?

This table shows coefficient estimates from fixed effect regressions of growth opportunities on the natural log of assets, dummy variables for the military spending expansion and contraction period. The *post-2001* dummy indicates years from 2002 onwards. The *1996-2001* dummy is equal to one when the sample year is between 1996 and 2001. Five variables, namely market-to-book ratio (MTB), market-to-book of equity (MTBe), research expenditures to assets (R&D), capital expenditures to assets (CAPX) and annual sales growth rate (SaleGr), are used as proxies for growth opportunities. How these variables are defined can be found in Appendix I. Standard errors are heteroskedasticity and autocorrelation robust. T-statistics are shown below the coefficient estimates inside parentheses. ***, ** and * denote significance level at 1 %, 5 % and 10 %.

Panel A: Defense contractors versus other government contractors

	(1)	(2)	(3)	(4)	(5)
Dependent variable	MTB	MTBe	R&D	CAPX	SaleGr
logAssets	-0.136***	-0.178***	-0.301***	-0.072***	0.006
	(-29.63)	(-21.64)	(-31.67)	(-9.71)	(0.96)
post2002	-0.035***	-0.047***	0.062***	-0.326***	-0.211***
	(-3.50)	(-2.66)	(2.64)	(-19.23)	(-16.03)
pre1996	-0.125***	-0.195***	-0.159***	-0.045**	0.015
	(-10.37)	(-9.20)	(-5.88)	(-2.26)	(0.99)
Defense×Post-2001	**0.063*****	**0.095*****	-0.006	-0.065**	**0.127*****
	(3.98)	(3.46)	(-0.17)	(-2.46)	(6.14)
Defense×Pre-1996	-0.088***	-0.155***	0.058	0.045	-0.058**
	(-4.85)	(-4.94)	(1.50)	(1.50)	(-2.44)
N	13504	13884	6688	15228	15355
R^2	0.0848	0.0500	0.1575	0.0964	0.0265

Panel B: Defense contractors versus firms in the same industries

	(1)	(2)	(3)	(4)	(5)
Dependent variable	MTB	MTBe	R&D	CAPX	SaleGr
logAssets	-0.152***	-0.137***	-0.301***	-0.027***	0.029***
	(-55.92)	(-29.63)	(-67.01)	(-6.36)	(6.79)
post2002	-0.034***	-0.065***	0.070***	-0.475***	-0.248***
	(-6.25)	(-7.42)	(7.60)	(-54.12)	(-29.62)
pre1996	-0.105***	-0.110***	-0.138***	0.004	0.035***
	(-17.10)	(-11.21)	(-13.18)	(0.40)	(3.68)
Defense×Post-2001	**0.073*****	**0.081*****	-0.014	**0.051***	**0.148*****
	(4.49)	(3.25)	(-0.49)	(1.94)	(6.02)
Defense×Pre-1996	-0.119***	-0.212***	0.037	0.027	-0.063**
	(-6.56)	(-7.62)	(1.21)	(0.93)	(-2.27)
N	52733	52191	30106	59941	57261
R^2	0.0724	0.0266	0.1512	0.0797	0.0202

Table 3: Difference in difference: The total number of loan Covenants

This table shows results of difference-in-difference regressions in which the number of loan covenants is the dependent variable. *d_ defense* is a dummy variable indicating whether the firm is one of the contractors that had received any contract from US Department of Defense during the period from 2000 to 2013. *post_ 2001* is a dummy equal to one when it is year 2002 and afterwards. Column (2) and (4) use the number of financial covenants in loan agreements as the dependent variable. The estimated marginal effect using poisson regressions for each independent variable is reported. Heteroskedasticity- and autocorrelation-robust standard errors are adjusted for clustering at the firm level. T-statistics are shown below the coefficient estimates inside parentheses. ***, ** and * denote significance level at 1 %, 5 % and 10 %.

Control group	*Other government contractors*			*Industry peers (SIC3)*		
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	#Cov	#Cov	#Cov	#Cov	#Cov	#Cov
Defense	-0.000	0.336*	0.268*	-0.146	-0.101	-0.057
	(-0.00)	(1.91)	(1.82)	(-0.96)	(-0.71)	(-0.46)
Defense × Post2001	**-0.652*****	**-0.689*****	**-0.501*****	**-0.406****	**-0.328***	**-0.218**
	(-3.07)	(-3.54)	(-3.03)	(-2.26)	(-1.95)	(-1.48)
Post2001	0.008	0.409	-0.075	-0.254	-0.233	-0.624***
	(0.02)	(0.93)	(-0.20)	(-0.98)	(-0.97)	(-2.94)
logAssets		-0.322***	-0.145***		-0.108***	-0.125***
		(-11.01)	(-3.27)		(-6.53)	(-5.24)
Market_to_Book		-0.340***	-0.247***		-0.259***	-0.171***
		(-6.12)	(-5.22)		(-10.31)	(-8.17)
Leverage		2.389***	0.610***		2.201***	1.265***
		(10.34)	(3.07)		(16.97)	(11.78)
Profitability		8.205***	3.783**		8.074***	7.300***
		(4.16)	(2.21)		(13.50)	(13.28)
Tangibility		-2.359***	-1.375***		-1.262***	-1.130***
		(-7.35)	(-5.15)		(-9.07)	(-9.14)
Amt_Assets			1.612***			0.104
			(8.55)			(1.59)
Maturity			0.014***			0.014***
			(6.19)			(11.29)
lnNLenders			0.278***			0.387***
			(4.66)			(11.98)
Secu (d)			1.814***			1.490***
			(17.02)			(27.92)
Specification	Poisson	Poisson	Poisson	Poisson	Poisson	Poisson
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	2212	2212	2212	7353	7353	7353
Treated	908	908	908	894	894	894
pseudo R^2	0.0281	0.0670	0.1294	0.0094	0.0371	0.0781

Table 4: Which types of covenants decline for defense contractors after the war?

This table shows results of difference-in-difference regressions in which different measures of covenant intensity are the dependent variable. Column (1)-(3) use loans borrowed by defense contractors and non-defense government contractors in the regression. The dependent variables are the number of sweeps, the number of financial covenants and the tightness of financial covenants. Column (4)-(6) replace non-defense contractors with the industry peers of defense firms as the control group and the dependent variables are the same. The dependent variable in panel B is the presence of a specific type of sweeps. There are six types of sweeps in total, namely, dividend sweep, asset sales sweep, debt issuance sweep, equity issuance sweep, insurance sweep and excess cash flow sweep. In panel C, the universe of financial covenants are classified into 6 types, namely investment, leverage, profitability, coverage, liquidity and net worth covenants. When the dependent variable is the number of covenants, we choose the poisson regression to predict the covenant intensity outcome. When it is covenant tightness, we use simple OLS regressions. Heteroskedasticity- and autocorrelation-robust standard errors are adjusted for clustering at the firm level. T-statistics are shown below the coefficient estimates inside parentheses. ***, ** and * denote significance level at 1 %, 5 % and 10 %.

Panel A: Alternative Covenant Intensity Measures

Dependent variable	*#Sweep*	*#Fincov*	*Tightness*	*#Sweep*	*#Fincov*	*Tightness*
Defense × Post-2001	**-0.318*****	-0.094	0.011	-0.096	-0.093	0.057
	(-2.93)	(-0.97)	(0.24)	(-0.99)	(-1.10)	(1.52)
Control group	other	other	other	sic3	sic3	sic3
Specification	Poisson	Poisson	OLS	Poisson	Poisson	OLS
N	2212	2212	1497	7353	7353	4519
Treated	908	908	619	894	894	615
(pseudo) R^2	0.1771	0.0566	0.1672	0.1243	0.0299	0.1369

Panel B: Types of General Covenants

Restrictions	*Dividends*	*AssetSales*	*DebtIssuev*	*EquityIssue*	*Insurance*	*ExcessCash*
Defense × Post2001	-0.038	**-0.110****	**-0.099*****	**-0.092*****	**-0.079*****	-0.001
	(-0.88)	(-2.47)	(-2.74)	(-2.88)	(-2.64)	(-0.05)
Specification	Probit	Probit	Probit	Probit	Probit	Probit
N	2278	2218	2218	2218	2218	2218
Treated	947	914	914	914	914	914
pseudo R^2	0.1921	0.2985	0.2489	0.1812	0.2652	0.4090

Panel C: The Type of Financial Covenants

Restrictions	*Investment*	*Leverage*	*Profitability*	*Coverage*	*Liquidity*	*Net worth*
Defense × Post2001	**-0.058****	0.036	-0.008	-0.027	-0.008	0.111**
	(-2.02)	(0.94)	(-0.17)	(-0.65)	(-0.56)	(2.34)
Specification	Probit	Probit	Probit	Probit	Probit	Probit
N	2212	2212	2212	2212	2160	2212
Treated	894	894	894	894	894	894
pseudo R^2	0.2251	0.1804	0.2337	0.1564	0.2650	0.2009

Table 5: Are financial covenants tightening or loosening?

This table shows results of a probit DID specification with a full set of control variables are used to capture the choice of using build-up in financial covenants. We examine the six most commonly used financial covenants and their threshold build-up, namely total debt to EBITDA (*D/EBITDA*), interest coverage ratio (*IntCover*), fixed charge coverage (*FixCharge*), leverage ratio (*Leverage*), debt to tangible net worth (*D/TNW*) and senior debt to EBITDA (*SD/EBITDA*). The trend of the threshold is *decreasing* if the threshold of a certain covenant is declining during the loan maturity and is *increasing* if the threshold is getting higher since initiation. The dependent variable is a dummy variable indicating whether a specific covenant has a decreasing or increasing trend. In column (1), the dummy variable is equal to one if the total debt to EBITDDA covenant (if the loan has one) has a decreasing trend and zero if it has a fluctuating or increasing trend. Dummies for the rest of columns are defined in a similar manner. Heteroskedasticity- and autocorrelation-robust standard errors are adjusted for clustering at the firm level. T-statistics are shown below the coefficient estimates inside parentheses. ***, ** and * denote significance level at 1 %, 5 % and 10 %.

	(1)	(2)	(3)	(4)	(5)	(6)
Build-up	*D/EBITDA*	*IntCover*	*FixCharge*	*Leverage*	*D/TNW*	*SD/EBITDA*
Trend(Y/N)	↓	↑	↑	↓	↓	↓
Defense	0.145**	0.148**	-0.041	-0.007	0.010	0.075
	(2.27)	(2.53)	(-0.78)	(-0.17)	(0.12)	(0.42)
Defense × Post2001	**-0.156****	**-0.114****	-0.066	-0.031	-0.075	-0.175
	(-2.46)	(-2.11)	(-1.06)	(-0.54)	(-0.69)	(-0.93)
Post2001	-0.271**	-0.238*	-0.423**	-0.091	-0.068	0.925***
	(-2.02)	(-1.83)	(-2.04)	(-1.07)	(-0.49)	(19.89)
Specification	Probit	Probit	Probit	Probit	Probit	Probit
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
N	1253	763	815	288	145	190
Treated	477	324	294	180	65	60
pseudo R^2	0.2826	0.3512	0.1507	0.2992	0.3019	0.3021

Table 6: The timing of the event: Placebo test

This table shows the results of a placebo test of the DID analysis in this paper. Aside from 2002 which is the true treatment year, we construct 12 artificial treatment years as a placebo test. For each artificial treatment year, we include two years before and two years after as the analysis sample with the treatment year excluded. Heteroskedasticity- and autocorrelation-robust standard errors are adjusted for clustering at the firm level. T-statistics are shown below the coefficient estimates inside parentheses. ***, ** and * denote significance level at 1 %, 5 % and 10 %.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Cutoff Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Defense	0.281	0.170	-0.070	-0.026	0.408	0.128	-0.418*	-0.213	-0.209	-0.475**	-0.153	-0.135	-0.028
	(0.97)	(0.64)	(-0.27)	(-0.09)	(1.56)	(0.55)	(-1.85)	(-0.97)	(-1.02)	(-2.13)	(-0.65)	(-0.58)	(-0.11)
Defense×Post	-0.221	0.098	0.098	-0.487	**-0.683****	-0.368	-0.116	-0.026	0.029	0.432	0.486	-0.179	-0.422
	(-0.62)	(0.28)	(0.29)	(-1.46)	(-2.29)	(-1.29)	(-0.37)	(-0.08)	(0.09)	(1.13)	(1.26)	(-0.55)	(-1.25)
Post	0.234	0.002	0.393	0.314	0.897***	-0.214	-0.621**	-0.666***	-0.456	0.226	-0.205	-0.371	-0.726*
	(0.58)	(0.01)	(1.36)	(1.29)	(3.80)	(-0.44)	(-2.05)	(-3.04)	(-1.63)	(0.98)	(1.20)	(0.30)	(-1.88)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	502	503	515	568	607	664	685	654	648	564	477	440	403
Treated	184	184	202	230	249	267	283	268	278	256	213	194	178
Control	318	319	313	338	358	397	402	386	370	308	264	246	225
pseudo R^2	0.1070	0.1109	0.1325	0.1315	0.1454	0.1496	0.1508	0.1546	0.1401	0.1277	0.1155	0.1306	0.1506

Table 7: The channel of less creditor control: Financial flexibility

This table reports the heterogeneous effect of growth opportunities on loan covenants with respect to different levels financial constraints. We use three variables to capture how financially constrained the firm is. The first one is firm size which is measured by the natural logarithm of the book value of assets. The second variable is firm age which is the years elapsed since the first year the firm appeared in Compustat. The last one is the Whited-Wu index (WWI) constructed following Whited and Wu (2006). Each time, the sample is divided into two parts with respect to these three measures. The null hypothesis that the interaction term $Defense \times Post2001$ is equal ($\rho_H = \rho_L$) between the two sub-samples is tested and the results are provided at the bottom. Heteroskedasticity- and autocorrelation-robust standard errors are adjusted for clustering at the firm level. T-statistics are shown below the coefficient estimates inside parentheses. ***, ** and * denote significance level at 1 %, 5 % and 10 %.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Adj. Leverage		Tangibility		Cash Flow		Z-Score		Div. payer?	
	high	low	low	high	low	high	low	high	yes	no
Defense	0.245	0.223	0.565***	-0.012	0.365*	0.101	0.512**	0.053	0.599***	0.128
	(1.06)	(1.20)	(2.84)	(-0.05)	(1.75)	(0.50)	(2.20)	(0.28)	(2.94)	(0.65)
Defense × Post2001	**-0.639****	-0.323	**-0.859*****	-0.183	**-0.768*****	-0.160	**-0.854*****	-0.077	**-0.789*****	-0.214
	(-2.50)	(-1.50)	(-3.86)	(-0.74)	(-3.24)	(-0.71)	(-3.35)	(-0.35)	(-3.35)	(-0.90)
Post2001	0.253	-0.246	0.022	-0.216	0.421	-0.584	0.553	-0.624	-0.046	-0.262
	(0.47)	(-0.49)	(0.04)	(-0.45)	(0.76)	(-1.27)	(0.90)	(-1.41)	(-0.12)	(-0.42)
logAssets	-0.139**	-0.195***	-0.031	-0.251***	-0.072	-0.256***	-0.141**	-0.207***	-0.224***	-0.102
	(-2.10)	(-3.20)	(-0.46)	(-4.56)	(-1.09)	(-4.30)	(-2.05)	(-3.28)	(-4.30)	(-1.54)
Market_to_Book	-0.413***	-0.125**	-0.194***	-0.310***	-0.231***	-0.105**	-0.436***	-0.118***	-0.318***	-0.272***
	(-5.14)	(-2.47)	(-3.17)	(-3.99)	(-2.67)	(-2.14)	(-3.54)	(-2.70)	(-3.61)	(-4.68)
Leverage	-0.017	0.918**	0.971***	0.236	0.234	0.772***	0.304	1.148***	1.035***	0.647**
	(-0.06)	(2.00)	(3.15)	(0.91)	(0.63)	(3.84)	(0.86)	(2.88)	(3.19)	(2.38)
Profitability	4.868*	3.169	2.457	3.868*	9.972***	-5.820**	10.406***	-3.646	-8.756**	6.864***
	(1.88)	(1.50)	(0.89)	(1.90)	(2.88)	(-1.98)	(3.84)	(-1.38)	(-2.46)	(3.15)
Tangibility	-1.469***	-0.967***	-2.201	-0.929**	-1.246***	-1.087***	-1.715***	-0.725**	-0.681*	-1.651***
	(-3.69)	(-2.75)	(-1.59)	(-2.35)	(-2.95)	(-3.22)	(-4.38)	(-1.99)	(-1.92)	(-4.35)
Amt_Assets	1.818***	1.802***	1.665***	1.485***	2.591***	1.244***	1.821***	1.691***	1.631***	1.731***
	(6.62)	(5.80)	(6.36)	(5.75)	(6.79)	(6.86)	(5.15)	(7.60)	(5.52)	(6.09)
Maturity	0.017***	0.009***	0.026***	0.005*	0.015***	0.011***	0.018***	0.009***	0.011***	0.013***
	(5.07)	(3.01)	(7.20)	(1.79)	(4.37)	(4.16)	(4.86)	(2.96)	(3.71)	(4.30)
lnNLenders	0.302***	0.227**	0.051	0.461***	0.286***	0.248***	0.367***	0.175**	-0.038	0.477***
	(3.65)	(2.37)	(0.57)	(6.16)	(3.32)	(3.05)	(4.03)	(1.97)	(-0.50)	(5.68)
Secu (d)	2.114***	1.383***	1.789***	1.837***	1.706***	1.806***	2.016***	1.459***	1.352***	1.494***
	(13.04)	(10.01)	(11.12)	(13.48)	(10.85)	(12.92)	(11.46)	(10.74)	(7.62)	(10.94)
Lend_tight	-0.065	0.294	1.030*	-0.420	0.528	-0.041	0.062	0.222	-0.215	0.748
	(-0.10)	(0.47)	(1.66)	(-0.65)	(0.82)	(-0.07)	(0.09)	(0.36)	(-0.37)	(1.18)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1089	1102	1112	1100	1110	1102	1072	1062	805	1385
pseudo R^2	0.1428	0.1040	0.1354	0.1287	0.1132	0.1586	0.1350	0.1248	0.1691	0.0884

Table 8: The channel of less creditor control: Product market environment

This table reports the heterogeneous effect of growth opportunities on loan covenants with respect to different product market environment. We use three variables to capture how valuable being flexibility is for the firm in the product market. The first one is division dispersion which is the fraction of segments that operate in industries with non-overlapping two-digit SIC codes, following Duchin and Sosyura (2013). The second indicates the existence of at least one foreign segment. The last one is the Compustat-based HHI. Each time, the sample is divided into two parts with respect to these three measures. The null hypothesis that the interaction term $Defense \times Post2001$ is equal ($\rho_H = \rho_L$) between the two sub-samples is tested and the results are provided at the bottom. Heteroskedasticity- and autocorrelation-robust standard errors are adjusted for clustering at the firm level. T-statistics are shown below the coefficient estimates inside parentheses. ***, ** and * denote significance level at 1 %, 5 % and 10 %.

	(1)	(2)	(3)	(4)	(5)	(6)
	Division dispersion		Foreign segment(Y/N)		3-digit SIC HHI	
	low	high	No	Yes	low	high
Defense	0.549	0.699*	0.479	0.775*	0.241	0.709**
	(1.51)	(1.71)	(1.21)	(1.95)	(0.50)	(2.05)
Defense × Post2001	-0.653	**-0.746***	0.124	**-0.884****	-0.059	**-1.183*****
	(-1.49)	(-1.88)	(0.20)	(-2.37)	(-0.11)	(-3.66)
Post2001	0.449**	0.933***	0.412**	0.771***	0.316	0.883***
	(2.44)	(4.45)	(2.03)	(3.81)	(1.54)	(4.38)
logAssets	-0.026	-0.259***	0.047	-0.378***	-0.107	-0.160*
	(-0.28)	(-2.63)	(0.43)	(-4.27)	(-1.06)	(-1.82)
Market_to_Book	-0.150**	-0.503***	-0.213***	-0.228**	-0.268**	-0.167**
	(-2.31)	(-3.24)	(-2.69)	(-2.14)	(-2.27)	(-2.35)
Leverage	0.681*	3.037***	0.470	1.999***	0.742*	1.166***
	(1.93)	(5.20)	(1.26)	(5.30)	(1.94)	(2.92)
Profitability	6.367**	5.231	8.480**	1.618	3.712	6.882**
	(2.06)	(1.12)	(2.45)	(0.42)	(0.74)	(2.18)
Tangibility	-1.746***	-1.656***	-2.061***	-1.301**	-1.260**	-2.551***
	(-3.39)	(-2.62)	(-3.69)	(-2.13)	(-2.30)	(-4.26)
Amt_Assets	1.434***	2.081***	1.750***	1.069**	1.777***	0.947***
	(3.67)	(4.63)	(4.44)	(2.23)	(3.99)	(2.79)
Maturity	0.013***	0.014***	0.014***	0.014***	0.009**	0.025***
	(3.44)	(2.62)	(3.19)	(2.88)	(2.21)	(5.24)
lnNLenders	0.449***	0.234*	0.359***	0.452***	0.499***	0.264**
	(3.98)	(1.66)	(2.67)	(3.80)	(3.80)	(2.38)
Secu (d)	1.384***	1.878***	1.525***	1.599***	2.265***	1.178***
	(7.10)	(8.27)	(6.57)	(8.17)	(9.61)	(6.25)
Lend_tight	0.194	1.363***	0.732*	0.716**	0.985**	0.772**
	(0.54)	(3.89)	(1.88)	(2.11)	(2.54)	(2.16)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	723	463	626	560	578	612
pseudo R^2	0.0872	0.1468	0.0867	0.1252	0.1171	0.0950

Table 9: The channel of less creditor control: Information asymmetry

This table reports the heterogeneous effect of growth opportunities on loan covenants with respect to different levels of information asymmetry. We use two variables to capture how opaque the firm is. The first one is the number of stock analysts for the borrower firm. The second one is the dispersion of analyst earnings forecast constructed following Diether, Malloy, and Scherbina (2002). The sample is divided into two halves with respect to these two measures. The null hypothesis that the interaction term $Defense \times Post2001$ is equal ($\rho_H = \rho_L$) between the two sub-samples is tested and the results are provided at the bottom. Heteroskedasticity- and autocorrelation-robust standard errors are adjusted for clustering at the firm level. T-statistics are shown below the coefficient estimates inside parentheses. ***, ** and * denote significance level at 1 %, 5 % and 10 %.

	(1)	(2)	(3)	(4)
	Number of Analysts		Forecast dispersion	
	small	large	high	low
Defense	0.726***	0.025	0.675**	0.355
	(2.79)	(0.10)	(2.32)	(1.54)
Defense × Post2001	**-0.782****	-0.178	**-0.916****	-0.311
	(-2.80)	(-0.64)	(-2.95)	(-1.25)
Post2001	0.129	0.505	0.985**	-0.635
	(0.22)	(1.01)	(2.03)	(-1.08)
logAssets	-0.117	-0.275***	-0.285***	-0.182**
	(-1.29)	(-4.13)	(-3.99)	(-2.49)
Market_to_Book	-0.385***	-0.247***	-0.302***	-0.239***
	(-3.86)	(-3.06)	(-3.14)	(-2.77)
Leverage	0.892**	0.698**	0.647*	1.521***
	(2.56)	(2.09)	(1.79)	(4.39)
Profitability	4.874	3.151	7.552**	2.265
	(1.49)	(0.80)	(2.18)	(0.56)
Tangibility	-1.089**	-1.059***	-1.044**	-1.281***
	(-2.28)	(-2.58)	(-2.37)	(-2.93)
Amt_Assets	1.393***	1.508***	1.523***	1.718***
	(3.79)	(4.95)	(4.50)	(5.10)
Maturity	0.021***	0.006	0.018***	0.007*
	(5.35)	(1.57)	(4.30)	(1.88)
lnNLenders	0.286***	0.034	0.283***	0.086
	(2.84)	(0.35)	(2.83)	(0.83)
Secu (d)	1.753***	1.553***	1.541***	1.650***
	(11.04)	(8.12)	(8.80)	(9.23)
Lend_tight	-0.165	0.523	-0.077	-0.053
	(-0.23)	(0.73)	(-0.09)	(-0.08)
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
N	814	724	745	761
pseudo R^2	0.1239	0.1520	0.1244	0.1800

Table 10: Matching DID

This table shows results of difference-in-difference estimate for the *matched* loan sample. Panel A examines the total number of covenants and therefore a poisson DID regression is used. Panel B and C uses as the dependent variable the presence of a certain type of general covenants and financial covenants respectively. Panel D investigates the use of build-ups in financial covenants and the dependent variable is a dummy indicating whether the threshold of a financial covenant has increasing / decreasing trend. Year and industry (SIC2) fixed effects are controlled in all specifications. Heteroskedasticity- and autocorrelation-robust standard errors are adjusted for clustering at the firm level. T-statistics are shown below the coefficient estimates inside parentheses. ***, ** and * denote significance level at 1 %, 5 % and 10 %.

Panel A: Total Number of Covenants			
Measure	# Covenants	# General Covenants	# Financial Covenants
Defense × Post2001	**-0.428****	-0.186	-0.215
	(-2.09)	(-1.23)	(-1.61)
Specification	Poisson	Poisson	Poisson
Treated	889	889	889
N	2394	2394	2394

Panel B: Types of General Covenants						
Restrictions	*Dividends*	*AssetSales*	*DebtIssue*	*EquityIssue*	*Insurance*	*ExcessCash*
Defense × Post2001	-0.023	-0.021	-0.032	**-0.068****	-0.032	-0.004
	(-0.57)	(-0.42)	(-0.73)	(-2.39)	(-0.92)	(-0.19)
Specification	Probit	Probit	Probit	Probit	Probit	Probit
Treated	889	889	889	889	889	889
N	2394	2394	2394	2394	2394	2394
pseudo R^2	0.1724	0.1772	0.1517	0.1553	0.1809	0.3322

Panel C: Types of financial covenants						
Restrictions	*Investment*	*Leverage*	*Profitability*	*Coverage*	*Liquidity*	*Net worth*
Defense × Post2001	**-0.069****	-0.077	0.052	0.051	**-0.040*****	-0.007
	(-2.02)	(-1.28)	(1.04)	(1.50)	(-3.13)	(-0.11)
Specification	Probit	Probit	Probit	Probit	Probit	Probit
Treated	889	889	889	889	889	889
N	2394	2394	2394	2394	2394	2394
pseudo R^2	0.0756	0.0713	0.0527	0.0201	0.1203	0.0920

Panel D: Build-ups in financial covenants						
Build-up	*D/EBITDA*	*IntCover*	*FixCharge*	*Leverage*	*D/TNW*	*SD/EBITDA*
Trend(Y/N)	↓	↑	↑	↓	↓	↓
Defense × Post2001	-0.059	**-0.128*****	0.016	0.023	-0.024	0.141
	(-0.51)	(-3.47)	(0.23)	(0.34)	(-0.10)	(0.60)
Specification	Probit	Probit	Probit	Probit	Probit	Probit
Treated	468	318	290	175	65	59
N	1258	907	741	326	128	194
pseudo R^2	0.0643	0.1088	0.0767	0.1220	0.1130	0.1223

Table 11: Difference in difference: Robustness

This table shows results of some robustness tests on the existence of alternative channels. In column (1), the sample period is shortened to include only year 1996-2006. Column (2) drops firms that invest in lobbying for at least 3 years with at least 10,000 dollars each year. Only manufacturing firms are included in column (3) which are defined as firms with a SIC code between 2000 and 3999. Column (4) include only non-manufacturing firms. Column (5)-(11) interact other firm characteristics with the *Post*2001 dummy. Industry, year FE and a whole set of control variables are included in every regression. Heteroskedasticity- and autocorrelation-robust standard errors are adjusted for clustering at the firm level. T-statistics are shown below the coefficient estimates inside parentheses. ***, ** and * denote significance level at 1 %, 5 % and 10 %.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Sample	All	ex.Lobby	Manu	unManu	All	All	All	All	All	All	All
Defense	0.187	0.196	0.223	0.325	0.223	0.077	0.225	0.196	0.195	0.195	0.222
	(0.99)	(1.31)	(1.12)	(1.51)	(1.38)	(0.44)	(1.39)	(1.21)	(1.20)	(1.20)	(1.33)
Defense × Post-2001	**-0.436****	**-0.440*****	**-0.351**	**-0.719*****	**-0.478*****	**-0.276***	**-0.485*****	**-0.447*****	**-0.454*****	**-0.449*****	**-0.433****
	(-2.10)	(-2.61)	(-1.52)	(-3.06)	(-3.06)	(-1.73)	(-3.01)	(-2.87)	(-2.93)	(-2.83)	(-2.55)
MTB × Post-2001					-0.257***						-0.194**
					(-3.47)						(-2.41)
Asset × Post-2001						-0.180***					-0.162***
						(-4.31)					(-3.44)
Lever × Post-2001							-0.523				-0.324
							(-1.57)				(-0.86)
Profit × Post-2001								-5.746**			-1.751
								(-2.39)			(-0.63)
Tang × Post-2001									-0.891*		-0.470
									(-1.70)		(-0.74)
Cash × Post-2001										-1.276	-0.944
										(-1.28)	(-0.93)
Post 2001	-0.377	0.987**	-0.103	0.768*	0.242	0.868**	-0.042	-0.029	-0.011	-0.128	1.545***
	(-0.83)	(-0.27)	(1.77)	(-1.36)	(0.60)	(2.14)	(-0.11)	(-0.08)	(-0.03)	(-0.33)	(3.64)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rating	Yes	No	No	No	No	No	No	No	No	No	No
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1077	2149	985	1227	2212	2212	2212	2212	2212	2212	2212
pseudo R^2	0.2346	0.1284	0.1569	0.1074	0.1374	0.1378	0.1368	0.1370	0.1370	0.1368	0.1317

Table 12: Creditor Actions Post-violation

This table shows the different changes in firm financing and investment policies after covenant violations between defense contractors and non-defense contractors. The sample contains quarterly firm accounting information *in the violation quarter* from year 1996 to 2008. We examine changes of new debt issuance, new equity issuance, investment (capital expenditures) and PPE (property, plant and equipment) from the violation quarter to 2 quarters after covenant violations. How these variables are defined can be found in Appendix I. Specifically, we estimate the following change model.

$$Y_{i,t} - Y_{i,t-2} = \beta_0 + \beta_1 \text{Defense}_i + \beta_2 \text{Defense}_i * \text{Post2001}_{t-2} + \beta_3 \text{Post2001}_{t-2} + \beta_4 \text{SubsequentViolation}_{i,t-1} + \epsilon_{i,t}$$

Quarterly covenant violation data used in Nini, Smith, and Sufi (2012) is obtained from the website of Amir Sufi. *SubsequentViolation* is a dummy indicating whether the firm violates covenants in the subsequent quarter of covenant violations. Heteroskedasticity- and autocorrelation-robust standard errors are adjusted for clustering at the firm level. T-statistics are shown below the coefficient estimates inside parentheses. ***, ** and * denote significance level at 1 %, 5 % and 10 %.

Firm policies	(1) New Debt Issue	(2) New Equity Issue	(3) Investment	(4) log(PPE)
Defense	-0.023**	-0.002	-0.007	0.005
	(-2.50)	(-0.23)	(-0.75)	(0.13)
Defense × Post2001	0.027**	-0.021	0.013	0.020
	(2.34)	(-1.56)	(1.18)	(0.41)
Post2001	-0.001	0.011	0.004	0.037
	(-0.21)	(1.36)	(0.92)	(1.25)
Subsequent violation	-0.005	0.007	-0.002	-0.045***
	(-0.80)	(0.67)	(-0.44)	(-2.82)
N	1679	1260	1484	1744
R^2	0.0035	0.0029	0.0028	0.0077

Table A1: Variable Definitions

Variable	Definition
Dependent variables	
Covenant Intensity	Number of financial covenants
Covenant Tightness	It can be expressed as $p = 1 - \Phi\left((r_t - br)/\sigma\right)$, in which Φ is the standard normal cumulative distribution function and $\underline{r}$ is the minimum level of the financial ratio r_t the firm is obliged to maintain on a daily basis according to the loan contract. The initial covenant slack $(r_t - \underline{r})$ is then scaled by the standard error of the financial ratio σ.
Covenant Violation	Dummy =1 if there is at least one violation during a certain quarter which is extracted from Nini, Smith, and Sufi (2012).
Borrower characteristics	
lnAssets	The natural logarithm of Total Assets measured in million U.S. dollar, i.e. $log(atq)$
Leverage	Total Liabilities / Total Assets, i.e. $(dlcq + dlttq)/atq$
Profitability	EBITDA / Total Assets, i.e. $oibdpq/atq$
Tangibility	PP&E / Total Assets, i.e. $ppentq/atq$
CashFlowRisk	Variance of EBITDA calculated using observations in the past eight quarters in Compustat, divided by Total Assets.
Z-Score	The Altman's Z-Score $= 1.2*((actq-lctq)/atq)+1.4*(req/atq)+3.3*(piq/atq)+ 0.6*((prccq*cshoq)/ltq)+0.999*(saleq/atq)$
Investment	Capital expenditures / total assets, i.e. $capxq/atq$
New equity issue	(Issuance of new stocks - repurchase of new stocks) / total assets, i.e. $(sstkq - prstkcq)/atq$
New debt issue	The change of total debt / total assets, i.e. $(dlttq_t - dlttq_{t-1} + dlcq_t - dlcq_{t-1})/atq_{t-1}$
Investment covenants	restrictions on capital expenditures and long-term investment to net worth ratio.
Leverage covenants	restrictions on debt to equity, leverage ratio, loan to value, net debt to assets, senior leverage, total debt to tangible net worth, equity to assets, net worth to assets and debt to tangible net worth.
Profitability covenants	restrictions on debt to EBITDA, senior debt to EBITDA and EBITDA.
Coverage covenants	restrictions on interest coverage, fixed charge coverage, debt service ratio and cash interest coverage ratio.
Liquidity covenants	current ratio and quick ratio restrictions.
CapAssets	Capital Expenditures / Total Assets, i.e. $capx/at$
Loan characteristics	
lnMaturity	The natural logarithm of the deal maturity measured in months
Amount / Assets	The ratio of loan amount ($ million) over assets ($ million).
psdd	A dummy variable if any of the tranches in the loan package contain pricing grids, i.e. provisions that allow interest rate to change with firm performance such as credit rating, profitability, etc.
#lenders	The total number of lenders for a loan defined on the package level.
Secured	A dummy variable indicating whether the loan has collateral.
Relationship loan	A dummy variable indicating whether the firm borrows from the lender(s) from whom it has borrowed at least once during the last 5 years, a definition following Bharath, Dahiya, Saunders, and Srinivasan (2011).
Credit market conditions	
Credit spread	The yield difference between AAA-rated and BBA-rated corporate bonds.
Term spread	The yield difference between 10-year and 1-year teasury bills.
Tightened lending	The fraction of loan officiers in U.S. commercial banks reporting a tightened lending standard for C&I loans during the current quarter.

Table A2: Other Firm Characteristics: Defense Contractors and Benchmark Firms

This table shows coefficient estimates from fixed effect regressions of several firm characteristics on military spending period dummies and their interaction terms with the defense contractor dummy. The *post-2001* dummy indicates years from 2002 onwards. The *1996-2001* dummy is equal to one when the sample year is between 1996 and 2001. How these variables are defined can be found in Appendix I. Control variables such as profitability, tangibility, cash flow risk are only controlled in the first two columns to predict book and market leverage. Standard errors are heteroskedasticity and autocorrelation robust. T-statistics are shown below the coefficient estimates inside parentheses. ***, ** and * denote significance level at 1 %, 5 % and 10 %.

Panel A: Defense contractors versus firms in the same industries						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	Book Leverage	Market Leverage	Net Debt Issue	Net Equity Issue	Debt Maturity	EBITDA /Assets
logAssets	0.021***	0.040***	0.014***	-0.008***	-0.069***	0.033***
	(10.62)	(19.49)	(15.84)	(-11.44)	(-14.14)	(21.05)
Post2002	-0.024***	-0.033***	-0.021***	-0.010***	0.014	-0.025***
	(-5.84)	(-7.80)	(-10.54)	(-6.56)	(1.24)	(-6.74)
Pre1996	-0.026***	0.003	0.002	0.003	-0.055***	0.027***
	(-5.16)	(0.68)	(0.86)	(1.51)	(-4.31)	(6.35)
Defense×Post-2001	0.004	-0.004	0.000	**0.010****	**0.036****	**-0.018****
	(0.63)	(-0.64)	(0.04)	(4.35)	(2.35)	(-3.17)
Defense×Pre-1996	0.027***	0.038***	-0.004	-0.004*	0.033*	-0.008
	(3.66)	(5.06)	(-1.20)	(-1.71)	(1.84)	(-1.22)
Controls	Yes	Yes	No	No	No	No
N	13082	13082	13455	13455	6674	15531
R^2	0.0561	0.1263	0.0239	0.0334	0.0364	0.0307
Panel B: Defense contractors versus other government contractors						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	Book Leverage	Market Leverage	Net Debt Issue	Net Equity Issue	Debt Maturity	EBITDA /Assets
logAssets	0.009***	0.031***	0.017***	-0.007***	-0.054***	0.102***
	(7.19)	(29.34)	(30.51)	(-13.90)	(-28.06)	(82.81)
Post2002	0.006***	-0.011***	-0.021***	-0.015***	0.031***	-0.056***
	(2.64)	(-5.69)	(-20.16)	(-16.49)	(4.36)	(-20.93)
Pre1996	-0.026***	-0.008***	0.004***	0.008***	-0.023***	0.092***
	(-9.33)	(-3.75)	(3.37)	(8.35)	(-2.80)	(30.93)
Defense×Post-2001	**-0.017****	**-0.014****	-0.001	**0.015****	**0.030****	**-0.037****
	(-2.36)	(-2.38)	(-0.49)	(6.03)	(2.13)	(-4.65)
Defense×Pre-1996	0.025***	0.047***	-0.004	-0.010***	-0.010	-0.027***
	(3.07)	(7.03)	(-1.32)	(-3.59)	(-0.60)	(-3.05)
Controls	Yes	Yes	No	No	No	No
N	52457	52457	43218	43218	14230	60947
R^2	0.1030	0.0951	0.0270	0.0324	0.0545	0.1089

Table A3: Do "potential" defense contractors benefit from the war?

This table shows the result of a robustness test in which the treated group is defined instead as firms which have at least one defense-related segment but may not necessarily receive government contracts during the sample years. Specifically, a firm is defined to be a defense-related firm once its business segment description contains words closely related to defense products and services. These firms do not necessarily receive procurement contracts from the Department of Defense, making them *potential defense contractors*. Industry and year FE are included in every regression. Heteroskedasticity- and autocorrelation-robust standard errors are adjusted for clustering at the firm level. T-statistics are shown below the coefficient estimates inside parentheses. ***, ** and * denote significance level at 1 %, 5 % and 10 %.

Panel A: Non-defense contractors as the control group

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variables	*#Cov*	*#Cov*	*#Sweep*	*#Sweep*	*#Fincov*	*#Fincov*
Defense×post2001	**-0.880*****	**-0.653*****	**-0.499*****	**-0.400*****	**-0.350*****	-0.184
	(-3.38)	(-2.69)	(-2.65)	(-2.63)	(-2.74)	(-1.31)
Controls	No	Yes	No	Yes	No	Yes
N	1830	1337	1830	1337	1830	1337
Treated	558	409	558	409	558	409
pseudo R^2	0.0147	0.1086	0.0257	0.1632	0.0071	0.0383

Restrictions	*Dividends*	*Asset sales*	*Debt issue*	*Equity issue*	*Insurance*	*Excess cash*
Defense×post2001	0.002	**-0.187*****	**-0.130*****	-0.071	0.001	-0.020
	(0.03)	(-3.52)	(-2.83)	(-1.50)	(0.01)	(-0.84)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
N	1374	1341	1341	1341	1341	1341
Treated	423	413	413	413	413	413
pseudo R^2	0.1507	0.2845	0.2588	0.1810	0.2539	0.3818

Panel B: Industry peers (SIC3) as the control group

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variables	*#Cov*	*#Cov*	*#Sweep*	*#Sweep*	*#Fincov*	*#Fincov*
Defense×post2001	**-0.529****	-0.200	**-0.307****	-0.148	**-0.219****	-0.060
	(-2.39)	(-0.96)	(-2.04)	(-1.19)	(-1.98)	(-0.50)
Controls	No	Yes	No	Yes	No	Yes
N	6968	4931	6968	4931	6968	4931
Treated	554	407	554	407	554	407
pseudo R^2	0.0045	0.0866	0.0123	0.1328	0.0057	0.0343

Restrictions	*Dividends*	*Asset sales*	*Debt issue*	*Equity issue*	*Insurance*	*Excess cash*
Defense×post2001	0.059	**-0.088****	**-0.074*****	-0.036	0.029	0.001
	(1.55)	(-2.16)	(-2.65)	(-1.10)	(0.71)	(0.07)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
N	5047	4944	4944	4944	4944	4944
Treated	421	411	411	411	411	411
pseudo R^2	0.0976	0.2197	0.1713	0.1179	0.2340	0.3376

Table A4: Difference in difference: Other loan terms

This table shows results of the difference-in-difference analysis on other loan terms. The dependent variables are the relative loan amount, loan all-in-spread-drawn, the natural logarithm of loan maturity (months), whether the loan is secured (Y/N) and whether it contains performance pricing provisions (Y/N). Simple OLS is used when the dependent variables are continuous and the probit model is estimated when the dependent variables are dichotomous. Heteroskedasticity- and autocorrelation-robust standard errors are adjusted for clustering at the firm level. T-statistics are shown below the coefficient estimates inside parentheses. ***, ** and * denote significance level at 1 %, 5 % and 10 %.

	(1)	(2)	(3)	(4)	(5)
Dependent variables	Amount/Assets	Spread	log(maturity)	Secured (Y/N)	Performance
Defense	0.053***	5.212	0.011	0.008	0.020
	(4.30)	(0.85)	(0.23)	(0.24)	(0.66)
Defense×post2001	**-0.044*****	**-23.101*****	-0.087	**-0.073***	-0.014
	(-3.09)	(-2.88)	(-1.58)	(-1.90)	(-0.39)
Post2001	0.022	128.943***	0.160*	0.209***	0.073
	(0.78)	(6.65)	(1.74)	(3.12)	(1.04)
logAssets	-0.055***	-30.198***	-0.034***	-0.150***	0.001
	(-25.80)	(-24.84)	(-4.64)	(-23.25)	(0.22)
Market_to_Book	0.012**	-10.558***	-0.056***	-0.041***	-0.032***
	(2.25)	(-4.44)	(-4.20)	(-2.91)	(-3.44)
Leverage	0.265***	146.257***	0.419***	0.316***	-0.190***
	(8.28)	(10.07)	(6.79)	(5.62)	(-4.18)
Profitability	1.203***	-664.746***	2.811***	-2.164***	2.992***
	(6.74)	(-6.03)	(6.28)	(-3.14)	(7.45)
Tangibility	-0.129***	-30.027**	-0.077	-0.081	-0.052
	(-5.52)	(-2.12)	(-1.04)	(-1.37)	(-1.00)
Lend_tight	-0.100***	101.837***	-0.488***	0.168	0.105
	(-2.68)	(3.77)	(-3.39)	(1.59)	(1.07)
Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Models	OLS	OLS	OLS	Probit	Probit
N	1879	1743	1770	1879	1879
(pseudo) R^2	0.1756	0.2596	0.1208	0.1696	0.0493